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NOTE:—In certain cases it is not possible to check references in the original publication. Such references are marked with an asterisk.

ERRATUM

Vol. 14. p. 21. SHILS, M. E., & MCCOLLUM, E. V. (1943). For "A marked decrease in arginose activity . . . ", read "A marked decrease in arginase activity".

REVIEW ARTICLES

(1) " **The Present Position of Phenothiazine as an Anthelmintic** ".

(2) " **Trichomoniasis—A Review of Recent Literature** ".

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IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 14.] August, 1944. [No. 8.

DISEASES CAUSED BY BACTERIA AND FUNGI

WEED, L. A., MICHAEL, A. C., & HARGER, R. N. (1943). **Fatal Staphylococcus Intoxication from Goat Milk.**—*Amer. J. publ. Hlth.* **33.** 1314–1318. **1659**

Milk from a goat with peracute unilateral mastitis caused vomiting and diarrhoea in a man, 1½ hours after ingestion. Visionary defects followed for several days. The same batch of milk caused an acute fatal illness in two children (three and four years old) within 24 hours of ingestion. The same sample of milk used in cooked food eaten by seven adults and two other children caused no illness. The goat died within 24 hours of giving the milk in question. P.M. lesions in both children and goat were those of toxaemia, but typical renal cortical necrosis was seen only in the goat. Material from the udder contained numerous haemolytic staphylococci. Supernatant bacteria-free fluid from this material produced typical symptoms in kittens. Kittens were immunized against the effects of an infecting dose of the toxin by repeated subcutaneous injections of a homologous culture filtrate. The authors suggest either that the enterotoxin of this strain was thermolabile, or that the factor which kills rabbits when inoculated intravenously was responsible for the illness in these cases.—R. M. LOOSMORE.

I. *KOURILSKY, R., & MERCIER, P. (1941). Influence de différents éléments de l'inflammation sur le pouvoir pathogène cutané du staphylocoque. **[Influence of Different Elements of Inflammation on Skin-Pathogenic Power of Staphylococci].**—*C. R. Soc. Biol. Paris.* **135.** 1267–1269. **1660**

II. *KOURILSKY, R., & MERCIER, P. (1941). Action sur le pouvoir pathogène du staphylocoque de diverses substances augmentant l'inflammation et stimulant l'immunité. **[Action on Pathogenic Power of Staphylococci of Various Substances which Increase Inflammation and Stimulate Immunity].**—*Ibid.* 1270–1272. **1661**

III. *KOURILSKY, R., & MERCIER, P. (1941). Variations du pouvoir pathogène local du staphylocoque sous l'influence de nécroses cutanées par agents biologiques et physiques. **[Variation of Local Pathogenic Power of Staphylococci under Influence of Cutaneous Necrosis Caused by Biological and Physical Agents].**—*Ibid.* 1421–1424. **1662**

IV. *KOURILSKY, R., & MERCIER, P. (1941). Variations du pouvoir pathogène cutané du staphylocoque par inoculation dans les tissus en voie d'autolyse. **[Variation in Skin-Pathogenic Power of Staphylococci Caused by Inoculation in Tissues in Process of Autolysis].**—*Ibid.* 1424–1427. **1663**

V. *KOURILSKY, R., & MERCIER, P. (1941). Etudes sur les variations du pouvoir pathogène du staphylocoque (constatations histo-pathologiques). **[Studies on Variation in Pathogenic Power of Staphylococci (Histopathology)].**—*Rev. Immunol.* **6.** 291. **1664**

Absts. from absts. in *Zbl. Bakt. I.* (*Ref.*). **143.** 138–139]. [See also *V. B.* **11.** 347].

I. A 5–10-fold increase in the pathogenicity of staphylococcal strains of low virulence when injected intradermally or intraperitoneally in the rabbit, can be attained by the addition of histamine or cellular elements such as leucocytes or erythrocytes.

II. Various other substances, calcium chloride, tannin etc. were tried, and all, with the exception of tapioca, brought about an increase in the skin pathogenic power of the staphylococci. The inflammatory reaction was greater than that obtained where histamine or leucocytes were added, and took place within four days.

III. Production of a subcutaneous necrosis at the time of infection with staphylococci was also found to produce an enormous increase in the local pathogenicity of the organisms.

IV. A rapid rise in skin pathogenic power occurred when staphylococci were inoculated into tissues in the process of autolysis.

V. The authors attempted to demonstrate by histological methods the mechanism by which the virulence of staphylococci was increased when they were injected into some organs, and unaffected or decreased when injected into others. They found that the inflammatory reaction to staphylococci was most marked in the connective tissue and blood vessels, while parenchymatous cells were unaffected. The changes are therefore greatest in organs rich in connective tissue and with a good blood supply, such as liver, spleen, and skin. Lung tissue is exceptional and gives little reaction, but this is believed to be due to its bactericidal powers. Organs which are mainly parenchymatous, such as the kidney, show little reaction. Staphylococci injected into subcutaneous tissue, liver, or spleen, where a violent inflammatory reaction occurs, acquire a rapid rise in virulence, while the pathogenicity of organisms injected into tissues showing little inflammation remains unchanged. The reaction of the various organs to a natural infection with staphylococci can thus be explained, and depends on the connective tissue content and blood supply of the organs concerned.—A. F. R.

SHOOTER, R. A., & WATERWORTH, P. M. (1944). **A Note on the Transmissibility of Haemolytic Streptococcal Infection by Flies.**—*Brit. med. J.* Feb. 19th. 247–248. **1665**

Flies in a surgical ward were trapped on blood agar plates which were thereby inoculated. After incubation, nine out of 27 plates gave cultures of haemolytic streptococci. These organisms were absent from 22 control cultures of flies caught in the laboratory. The streptococcus was identical with one which had been recently

isolated in the ward, suggesting its possible transmission by flies.—J. M. PETERS.

I. BRYAN, C. S., RUHLAND, H. H., & HORWOOD, R. E. (1943). **The Interpretation of the Results of the Microscopic Test for Infectious Mastitis.**—*Quart. Bull. Mich. agric. Exp. Sta.* **25.** 314–318. **1666**

II. HORWOOD, R. E., CLARK, C. F., & BRYAN, C. S. (1943). **Some Results with Mastitis at Michigan State College.**—*Ibid.* **26.** 43–50. **1667**

I. A discussion, written for the dairy farmer, classifying mastitis and explaining the interpretation to be placed on reports from the Experiment Station laboratory.

II. The history of the college herd since 1932. In spite of various methods of treatment, little progress was made towards eradication until 1940 when a number of old infected cows were removed from the herd. Treatment with short-wave diathermy was unsuccessful, but tyrothricin was effective except in acute cases. "Lactovaccine" (prepared by adding gentian violet to milk from affected quarters to give a final concentration of 1 : 10,000) was not effective in preventing or curing infection. Since 1940, there has been less infectious mastitis but more acute systemic cases where no infection was demonstrated.—R. M. ARNOLD.

VELU, H., SOULIÉ, P., & BELLOCQ, B. (1943). Charbon pulmonaire et intoxication chlorée : doses minima infectantes de spores. **[Pulmonary Anthrax and Chlorine Poisoning : the Minimum Dose of Spores Necessary to set up Infection].**—*C. R. Soc. Biol. Paris.* **137.** 160–161. **1668**

Mice given very slight exposure to Cl_2 resisted infection with 500 anthrax spores. After slight exposure (150 mg. per cu. m. for 10 min.), over 10 spores were required to produce infection, while after exposure to five times this amount of Cl_2, less than 10 spores were effective.—J. G. CARR.

SFORZA, M. (1942). Identificazione di alcune ceppi eritrei di tubercolosi bovina. **[Identification of some Eritrean Strains of Bovine Tubercle Bacilli].**—*Boll. Soc. ital. Med. Igiene trop.* **1.** No. 1. 95–101. **1669**

In a preliminary study of bovine TB. in Eritrea, about 30 affected cattle were detected at the Asmara abattoir in two years, the lesions being mainly of the chronic caseous or calcified types, but the fibro-epithelioid type of lesions was also encountered.

Strains of organisms isolated from these animals proved typical of bovine tubercle bacilli in respect of morphology and cultural and biological characteristics, and local animals inoculated with them gave typical reactions to European tuberculin. Intravenous inoculation of culture into calves caused death in 17–42 days, but subcutaneous inoculation of 15 calves resulted in the death of two calves, whilst the remainder were slaughtered between 107 and 230 days after inoculation. From the lesions encountered on the autopsies of these calves it is concluded that the Eritrean cattle are less susceptible to TB. than European cattle, and that the highland cattle of Eritrea are less susceptible than the cattle of the lowlands. It is pointed out that the factors involved in this resistance should repay investigation, and that in view of the great susceptibility of the human population of Eritrea to the disease, it has considerable interest.—U. F. RICHARDSON.

CUTBILL, L. J., & LYNN, A. (1944). **Pulmonary Tuberculosis of Bovine Origin. With Notes on Bovine Infection in Three Families.**—*Brit. med. J.* Feb. 26th. 283–285. **1670**

In a sanatorium 48 (2·28%) cases of pulmonary TB. were found to be due to bacilli of the bovine type. The authors discuss the means by which bovine type infection takes place, giving illustrations from the family histories of the patients in their charge.—J. M. P.

*MAGNUSSON, H., & MARCUSSON, E. (1943). Om tuberkulösa masktromber och tarmsår hos hästen. **[Thrombosis and Intestinal Ulceration of Tuberculous Origin in Horses].**—*Svensk VetTidskr.* **48.** 293. [Abst. from abst. in *Norsk VetTidsskr.* **55.** 544]. **1671**

Case records are given of TB. originating evidently from infected cow's milk, in two horses in which there was thrombosis of the mesenteric vessels and tuberculous ulcers in the colon.—J. E.

RIORDAN, J. T. (1943). **Rectal Tuberculosis in Monkeys from the Use of Contaminated Thermometers.**—*J. infect. Dis.* **73.** 93–94. **1672**

TB. of distinctive pathogenesis was induced in 29 out of 212 monkeys (mostly *Macaca mulatta*) by the daily use of a contaminated thermometer.

The lesions in each case involved the rectum and pelvic cavity. Typically, the primary lesion was in the rectum and there were multiple midline pelvic abscesses (presumably in the lymph nodes) extending to the mesenteric lymph nodes, sometimes to the liver and spleen, but rarely beyond the diaphragm except in very advanced cases when miliary lesions were found in the lungs.—R. M. ARNOLD.

POINDEXTER, H. A. (1943). **The Effects of Secondary Microörganisms on Experimental Tuberculosis in Rabbits. Part II.**—*Amer. Rev. Tuberc.* **48.** 261–271. [Spanish summary]. [For previous article, see *V. B.* **13.** 416]. **1673**

Rabbits were chosen for this study because of the non-progressive nature in these animals of human type *Mycobacterium tuberculosis* infection. Injection of *Mycobacterium tuberculosis* concurrently with *Monilia candida* or *Staphylococcus aureus* did not cause significant variation in the course of the disease.

Streptococcus viridans (a strain isolated from human TB. sputum) injected together with human type *Mycobact. tuberculosis* caused progressive emaciation and arthritis and caused the death of three out of seven inoculated rabbits within a year.

Injection of undigested TB. sputum caused increased synergic action and was fatal to rabbits. Organisms isolated from the sputum were *Mycobact. tuberculosis*, *Staph. aureus*, *Haemophilus influenzae*, *Micrococcus catarrhalis*, an α-haemolytic streptococcus and saprophytic spirochaetes.—R. M. ARNOLD.

GRINI, O. (1944). Tuberkulose hos en tiur. **[Tuberculosis in a Capercailzie].**—*Norsk VetTidsskr.* **56.** 22–24. [English & German summaries. English summary slightly amended]. **1674**

A case of TB. in a capercailzie is described. Lesions were present in the liver, spleen, lungs, and the right femur. Acid-fast rods were observed microscopically, and avian type tubercle bacilli were cultured from the organs. G. has previously described (1942) infection by acid-fast bacilli in a black grouse. These two cases are particularly interesting since avian TB. does not frequently occur in Norway.

JACOBS, M. A., & PETROFF, S. A. (1941). **Etiological Studies of Tuberculosis, I. The Occurrence of Tubercle Bacilli on Garments and Books Handled by Patients with Open Tuberculosis.**—*Quart. Bull. Sea View Hosp.* **7.** 33–39. **1675**

KATZ, H. L. (1941). **Etiological Studies of Tuberculosis, II. Nasal and Pharyngeal Washings of the Medical Staff Exposed to Tuberculous Patients.**—*Ibid.* 40–44. **1676**

I. The authors were not able to demonstrate, by means of g. pig inoculation, the presence of viable

tubercle bacilli on books handled by patients showing advanced TB. with uncontrollable cough and a positive sputum. Dust samples collected by scraping garments worn by these patients were not infective to g. pigs on inhalation and subcutaneous injection.

Storage of books for several weeks until the morbid material has completely dried and exposure of garments to sun and air for a few days constitute the precautionary measures suggested for the prevention of infection in those in contact with such infective material.

II. K. inoculated 40 g. pigs with nasopharngeal washings of ten members of the medical staff taken before and after exposure to open cases of pulmonary TB. In no single instance did TB. develop in the g. pigs. K. emphasizes that these results should not be construed as an excuse for disregarding the precautions usually taken by hospital personnel.—M. Levi.

Kraus, E. (1942). Untersuchungen über die Verbreitung von Tuberkelbazillen aus den Abwässern einer Lungenheilstätte. [**Examination for Tubercle Bacilli in Waste Water from a TB. Sanatorium**].—*Arch. Hyg., Berl.* **128.** 112–122. **1677**

Effluent from a TB. sanatorium was always found to be heavily infected with tubercle bacilli. Large numbers of tubercle bacilli were also recovered from the sewage sediment and from grass and earth over which the sewage had passed. [See also *V. B.* **14.** 148, abst. 954.]—J. Francis.

*Darricarrere, R. T., & Prado, E. (1940). Virulencia de cepas de bacilos de Koch conservadas al vacio. [**Virulence of Tubercle Bacilli Preserved** *in vacuo*].—*Rev. Inst. Bact. Chile.* **7.** 25–28. **1678**

Strains of human, avian, and bovine type tubercle bacilli, including the BCG strain, were preserved *in vacuo* for 24 months. All then grew on Löwenstein's medium with their original virulence and type characters unimpaired, although there was an appreciable diminution in the number of colonies that developed. Bovine and avian strains, originally smooth, produced a few rough colonies. The human strains remained rough.—I. W. Brocklehurst.

Prokhorov, P. G. (1940). Rol' reaktsii svyazyvaniya komplementa v diagnostike paratuberkuleznovo enterita krupnovo rogatovo skota. [**Role of the Complement-Fixation Test in the Diagnosis of Johne's Disease**].—*Veterinariya, Moscow.* No. 2. pp. 18–25. [French summary]. **1679**

Using antigen prepared from *Mycobacterium johnei* according to the method of Nègre and Boquet, P. carried out c.-f. tests for Johne's disease in slaughter animals. He claims that the results of the test agreed with P.M. and bacteriological findings in 78·58%. Previous subcutaneous testing with avian tuberculin and johnin did not influence the test. Some experimentally infected calves gave a positive c.-f. reaction as early as the 22nd day and others on the 36th, 68th, 76th, and 86th day and later after infection. Negative reactions were obtained in experimentally infected rabbits, chicks, and marmots 75 days after injection of virulent material.

P. concludes that this test may be used for the diagnosis of clinical cases and may be a valuable additional means of diagnosis in doubtful cases.—A. Moldawsky.

*Grini, O. (1942). Listerella monocytogenes som årsak til encephalitis hos sau. [*Listerella monocytogenes* **as Cause of Encephalitis in Sheep**].—*Norsk VetTidsskr.* **54.** 417–428. [Abst. from abst. in *Maanedsskr. Dyrlaeger.* **55.** 454]. **1680**

A detailed description of five cases in Norway. The observations agreed with the classical data.—J. E.

Graham, R., Levine, N. D., & Morrill, C. C. (1943). **Listerellosis in Domestic Animals. A Technical Discussion of Field and Laboratory Investigations.**—*Bull. Ill. agric. Exp. Sta.* No. 499. pp. 99. **1681**

The scope of this bulletin is indicated by the chapter headings :– field observations, epizoology, bacteriology, serology, experimental infection, histopathology, and studies in immunization. Part of the material is a summary of previous work on the subject, and part a description and discussion of original work done at the Illinois Experimental Station. A useful list of references is given.

Listerella [*Listeria*] *monocytogenes* causes encephalitis in sheep, cattle, goats, and pigs and may also cause abortion in the two first species. Certain other syndromes are attributed to *Listeria* by some authors. In the rabbit, g. pig, and in fowls, infection is generalized. In the horse, *Listeria* has been suggested as a cause of periodic ophthalmia, but the authors found no evidence to support this view.

Seven outbreaks in sheep were investigated in Illinois from 1937–42. The average death rate was 8·2%, recovery rarely occurring in sheep showing symptoms. The first signs were dullness, sometimes drooping of one ear, followed by blindness (with, or without, corneal opacity) "circling", and leaning against objects in their path. Affected sheep died within five days. The organism was isolated most frequently from the medulla oblongata of affected sheep, occasionally from other parts of the brain, and sometimes from the heart blood.

In four years, eight outbreaks were investigated in cattle, the average mortality being 3·95%. Symptoms of staggering, paralysis of masticatory muscles with drooling of saliva, drooping ears, "circling", and conjunctivitis are recorded. An isolated abortion was also observed on a farm where no other evidence of the infection was seen. Listeria was isolated from the medulla of most cases, but only inconstantly from other situations.

It is suggested, on rather unconvincing or circumstantial evidence, that rats may be responsible for maintaining the disease between outbreaks in ruminants. Infection is by inhalation or by ingestion. In diagnosis, the medulla is the best site for isolation of the organism and it is important to use a large dose of inoculum. A character of value in identification of *Listeria* is its heavy growth in glucose broth at room temperature.

Various experiments were carried out with a view to diagnosis by serological means, and several methods of preparing the antigen and carrying out the test were tried. The authors conclude that at present agglutination tests are of no value for diagnosis of the disease. Complement-fixation tests were also unsatisfactory.

Experimentally, the type of disease set up varies in different animals with the route of introduction of the organism. In sheep, symptoms and lesions typical of the natural disease were set up by intracerebral and intravenous injection of fairly large doses of the organism. [This is contrary to the findings of previous writers who obtained little results from intravenous inoculation of sheep.] Instillation of a culture into the eye caused discharge, keratitis, and corneal opacity after 13 days. This resolved, and reinfection could not be produced. Administration of culture by stomach tube produced only transient illness. Similar results were obtained in cattle, but those inoculated intravenously recovered. A pregnant heifer inoculated intravenously aborted ten days after a large dose (3 ml.) of culture. A horse died after intracerebral inoculation ; when given intravenously the culture was pathogenic only when given in large doses. In month-old pigs, an

intravenous dose of 0·5 ml. of culture caused depression and fever, and 1·0 ml. caused fever, posterior paralysis, and death in nine days. Supraconjunctival instillation of culture caused mild conjunctivitis and blepharism and, in one case, death in 11 days from listeria septicaemia. Intracranial and intravenous injection produced typical symptoms in cats but not in dogs. In fowls, fatal listeria septicaemia followed intracranial and frequently intravenous inoculation.

In both cats and chickens, diffuse necrosis of the myocardium was a prominent P.M. finding.

Lesions were most frequent in the white matter and took the form of local infiltration of neutrophiles and cuffing of cerebral blood vessels by lymphocytes and mononuclears. Associated with this there might be oedema of the meninges and purulent foci. After experimental infection, leucocytosis occurred sometimes followed by leucopaenia. Both have been recorded in natural outbreaks. There is little evidence of monocytosis in animals. In the main, the pathology of experimental infection closely simulates that of the natural disease.

Attempts at immunization of rabbits, g. pigs, fowls, and sheep by both killed and live cultures were unsuccessful. Passive immunization by use of serum was also unsuccessful and may in fact have caused increased sensitivity to the infection. Sulphanilamide in large doses was of some value in cases treated early.

—R. M. Arnold.

*Hjärre, A., & Sahlstedt, V. (1943). Om pasteurellos hos vilda djur i fångenskap. [**Pasteurellosis in Wild Animals in Captivity**].—*Svensk VetTidskr.* **48.** 325. [Abst. from abst. in *Norsk VetTidsskr.* **56.** 26]. **1682**

In 1922, in opposition to veterinary advice, a batch of German hares was sent to the Skomsen zoo at Stockholm. All the hares died of pasteurellosis and in the course of the same year other animals also died from the same cause—hares, beavers, a monkey, a bear, ptarmigans, owls, capercailzies, and an eagle.

The P.M. findings varied: in all the hares there was hyperaemia of the trachea and lungs and in some of them serofibrinous peritonitis or pleurisy also. In two beavers there was croupous or necrotic enteritis, with necrotic foci in the liver, and swollen spleen. The bear showed acute septicaemia and the monkey croupous pneumonia, the ptarmigans acute septicaemia, and the owls and capercailzies diphtheritic pharyngitis and laryngitis with necrosis of the liver and spleen.

In conclusion, the authors report the recent observation of pasteurellosis in minks and foxes, usually manifested by acute septicaemia, or, particularly in foxes, by pneumonia, pleurisy, or peritonitis.—J.E.

Smith, H. W., & Field, H. I. (1944). **The Isolation of Pasteurella aviseptica from a Turkey.**—*Vet. J.* **100.** 35–38. **1683**

An account of the isolation of *Past. aviseptica* from a turkey poult. The origin of the infection is discussed.

—J. M. Peters.

Green, R. G. (1943). **Virulence of Tularemia as Related to Animal and Arthropod Hosts.**—*Amer. J. Hyg.* **38.** 282–292. **1684**

The isolation of a strain of low virulence of *Pasteurella tularensis* in nature has been previously reported by G. In the present paper, he describes investigations which show a definite difference in their pathogenicity for g. pigs, between strains of *P. tularensis* obtained from hares and rabbits and from grouse. Ticks and tissue obtained from wild hares, rabbits and grouse were used to inject g. pigs, the difference between the rodent and avian tularemia being measured by the length of time for which g. pigs survived after inoculation. Strains from grouse killed on an average in 13 days while those from rabbits caused death in six days. Comparison of the lethal properties of material from the two sources, tissue and ticks, was also made. After several passages the virulence of grouse strains for g. pigs became equal to that of rabbits. It is therefore suggested that the difference which occurs between field and laboratory human tularemia infections may be due to the modification by passage of the organism through g. pigs which is incidental to laboratory work.—J. M. Peters.

Olsuf'ev, N. G. (1940). Novye eksperimental'nye dannye po voprosu o peredache slepnyami (Tabanus) tulyaremiĭnoĭ infektsii. [**New Experimental Data on Transmission of Tularaemia by Tabanids**].—*Med. Parazitol., Moscow.* **9.** 260–271. [French summary]. **1685**

This is a continuation of earlier work (1934) by O. It was observed that various tabanids (*Tabanus erberi, T. peculiaris*, and *Haematopota turkestana*) under field conditions in Alma-Ata (Kazakhstan) attack live and also the carcasses of dead rodents. Under laboratory conditions, it was confirmed that *T. solstitialis* fed on tularaemia-infected water-rat carcasses and on water contaminated with infected water-rat carcasses could transmit the infection to g. pigs with a single bite 34 hours after infection. In the gut contents and faeces of the infected flies (*T. autumnalis* and *T. bromius*), *Pasteurella tularensis* was found only for the first 3–4 days after infection, and not after 15–30 days as reported by American authors for *Chrysops discalis* and *C. noctifer*.

—A. Moldawsky.

Foote, H. B., Jellison, W. L., Steinhaus, E. A., & Kohls, G. M. (1943). **Effect of Chlorination on *Pasteurella tularensis* in Aqueous Suspension.**—*J. Amer. Wat. Wks Ass.* **35.** 902–910. **1686**

Past. tularensis, which has been recovered from streams in which beavers and muskrats are found, can be rendered harmless in water supplies by concentrations of chlorine acting for a period of time usually found effective for other infective agents in water.

—I. W. Brocklehurst.

Sforza, M. (1942). Segnalazione di Salmonella Paratiphi A in episodi infettivi di animali domestici in Eritrea. [*Salmonella paratyphi* **A Infection in Domestic Animals in Eritrea**].—*Boll. Soc. ital. Med. Igiene trop.* **1.** No. 2. 72–80. [English summary]. **1687**

Strains of organisms identified by their cultural and serological characteristics as *S. paratyphi* A were isolated from mules, an ox, and g. pigs. The mules were affected with a broncho-pneumonia associated with a nodular gelatinous necrosis of the lung parenchyma, and in one animal with a similar nodular necrosis of the liver. In the ox, the lungs contained necrotic lesions simulating those of TB., but on the inoculation of mice and g. pigs with material from these lesions an acute haemorrhagic enteritis developed. In g. pigs the organism was isolated from an epizootic in the institute stock, associated with enteritis in acute cases and focal necrosis of the liver in chronic cases.—U. F. Richardson.

Momberg-Jørgensen, H. C. (1944). Om Forekomsten af Salmonellabakterier i Krøskirtlerne hos sunde Svin. [**Occurrence of Salmonella in Mesenteric Lymph Nodes of Healthy Swine**].—*Maanedsskr. Dyrlaeger.* **56.** 38–45. **1688**

In this study the mesenteric lymph nodes from apparently healthy slaughter swine were pooled in groups of ten and used as seed material for Drigalski plates and brilliant green broth, any colonies being tested serologically.

At Ringsted abattoir, 2,070 swine were so examined and *S. typhi-murium* was isolated once. At Grindsted abattoir, 1,570 swine were examined and one strain of *S. enteritidis* was isolated.—J. E.

POMEROY, B. S., & FENSTERMACHER, R. (1943). **Salmonella Infections of Breeding Turkeys.**—*Amer. J. vet. Res.* **4.** 199–208. **1689**

The results are described of agglutination tests and bacteriological examinations carried out on adults, poults, dead-in-shell embryos, and infertile eggs from five different farms where, during the preceding year, poults had been found to harbour organisms of the salmonella group.

Suitable antigens for use for the diagnosis of paratyphoid infection by the rapid plate method with whole blood, could not be obtained; all those used gave variable results lacking in uniformity and with a great variance in sensitivity in most cases. The sera were tested with these same antigens and also with *S. pullorum*, *S. typhi-murium*, and *S. bredeney* tube antigens.

In addition to salmonella types already isolated and listed in a previous publication [see *V. B.* **12.** 202.], three additional types were found, namely, *S. new brunswick*, *S. illinois* and *S. panama*. Some of the poults harboured a multiple type salmonella infection, but this did not occur in any of the adults. Multiple types occurring were: *S. meleagridis*, *S. newington*, and *S. new brunswick*, and also *S. anatum* and *S. meleagridis*.

In one group of poults, heavy mortality occurred during the first month of life and approximately 10% of the survivors showed evidence of infection; 242 poults died out of 420 hatched. These 242 were all examined bacteriologically, an organism being recovered in 65 cases, 23 being identified as *S. new brunswick*, 16 as *S. pullorum*, 10 as *S. anatum*, 9 as *S. typhi-murium*, 2 as *S. meleagridis*, and 5 as mixed type. 544 eggs and eggs containing embryos were also examined, *S. pullorum* being isolated from one infertile egg and one full-term embryo and *S. typhi-murium* from another infertile egg and a full-term embryo.

Experimentally infected adult turkeys developed maximum aggln. titres within two weeks, but at the end of two months were liable to become negative to the test unless the infection had become established in the visceral organs.—J. D. BLAXLAND.

CARSON, J. R., & COLE, R. K. (1944). **Absence of Breed Differences in Bactericidal Power of Blood Plasma of Chickens over *Salmonella Pullorum*.**—*Poult. Sci.* **23.** 43–48. **1690**

White Leghorn fowls have been found to be more resistant to *S. pullorum* infection than some other breeds (Rhode Island Reds, Wyandottes, and Barred Plymouth Rocks). It had been reported by two other workers, using adult birds, that the difference was due to a high bactericidal power in the blood serum of the resistant breed. The authors concluded that the period when such difference might be most marked would be that between hatching and five days of age, *i.e.* at the period of greatest susceptibility. To test this theory, they made tests of the bactericidal activity of the plasma of 189 chicks of two breeds, a resistant White Leghorn and a susceptible New Hampshire. No difference in bactericidal potency of the plasma was found. The plasma of adult birds yielded the same result. A virulent strain of *S. pullorum* was used and it is suggested that a more attenuated strain might show greater susceptibility to the action of bactericides. The conclusion drawn from this test was that, since no difference in the bactericidal potency of the plasma of these two breeds was found, it cannot account for the greater resistance of White Leghorns to pullorum disease.—J. M. PETERS.

CHERRY, W. B., EDWARDS, P. R., & BRUNER, D. W. (1943). **Two New Salmonella Types with Similar Somatic Antigens.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 125–126. **1691**

From the faeces of a patient affected with a febrile disease accompanied by diarrhoea, a new salmonella type, *S. florida*, was isolated, with the antigenic structure (I), VI, XIV, XXV : d : 1, 7. . . . The same somatic factors were also present in another new type, *S. madelia*, obtained from the liver of a poult which died from septicaemia; *S. madelia* has the antigenic formula (I), VI, XIV, XXV : y : 1, 7. . . .—M. LEVI.

I. *KRIEBEL, K. (1938). Beitrag zur mikroskopischen Untersuchung von Nachgeburten auf Bruzellen mit Hilfe der Kösterschen Färbung. [**Microscopic Examination of the Placenta for Brucella Infection, using Köster's Stain**].—*Inaug. Dis., Hanover.* **1692**

II. *BARTHEL, A. (1939). Zur Diagnostik und Bakteriologie der Bruzellose. [**Diagnosis and Bacteriology of Brucellosis**].—*Inaug. Diss., Hanover.* **1693**

[Absts. from absts. in *Schweiz. Arch. Tierheilk.* **85.** 342–343.]

I. In 105 cows, in which serological and pathological findings were negative, microscopic examination, using Köster's stain, was also negative. In 25 animals with brucellosis, all three methods gave positive results. In another 25 animals, where either the agglutination or pathological examination was positive, microscopic confirmation was not achieved.

II. Bacteriological and serological methods of diagnosing *Br. abortus* infection are discussed. A comparison of the tube agglutination and rapid fresh blood aggln. methods revealed a discrepancy in results of only 1·1%. It was found that eight strains of *Br. abortus* were devoid of agglutinating capacity, whilst one strain agglutinated normal serum on three occasions and also the serum of some tuberculous animals. Degenerating strains of bacilli in 3·5% saline and trypaflavine solution often showed spontaneous aggln. Freshly grown strains of brucella may show no agglutinating powers at all at first, but will gain them after a few passages on suitable artificial culture-media.—D. N. SPRIGGS.

—. (1943). Kastningsbekaempelsen i Sverige. [**Control of Contagious Abortion in Sweden**].—*Maanedsskr. Dyrlaeger.* **55.** 455–456. **1694**

A new voluntary control scheme has been introduced to operate as from January 1st, 1944, under the Medical Board or any agricultural society approved by the board. Herd owners have to pledge themselves to co-operate for at least two years. They can send samples of blood, milk, or placenta for free examination and can have the calves vaccinated free when the circumstances are suitable. They are obliged to obey regulations made to prevent the spread of infection by public sales, unsafeguarded grazing or by transmission by copulation, so that infection-free herds may be preserved. Clean herds are so designated only by special notice from the Medical Board. In cases where a herd is made clean by sale for slaughter, the State pays compensation—up to 50 kronor for animals of ½–2 years and 75 kr. for older beasts. Clean herds can be reinforced by animals from other clean herds or from elsewhere, provided that the veterinarian vouches for their freedom from the infection.

In parts of the country where the disease is rare, herd owners can obtain free diagnostic examinations in the same way as owners enrolled in the part of the scheme mentioned above, and power can be used to force herd owners to allow such examinations to be made. If the disease is found in such areas, the Board can order the control scheme to be put into operation and can enforce the slaughter of infected animals. When clean areas

are determined by testing, the Epizootics Law is invoked and on the detection of infected animals the Board can order the slaughter of all of them. No cattle may be introduced into a clean area without special permission from the Board, and this permission then pertains only to individually tested animals.—J. E.

*Jürgenpott, H. (1938). Untersuchungen über die Impftiter und die Wirkung des Rakulins und der Abortus-Chinosol-Vakzine II im Infektionsversuch und in einem verseuchten Bestande. [**The Inoculation Titre and Action of " Rakulin " and** *Brucella abortus* **" Chinosol Vaccine II "**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **85.** 342–343]. **1695**

It is stated that within a few days after inoculation with both " Rakulin " [composition not given] and *Br. abortus* " chinosol vaccine II ", and particularly the latter, there appears, especially in heifers, a very high agglutination titre, up to 1 : 20,000 in some cases. The positive titres disappear at the earliest in 4½ months, in heifers often not for 11½ months, and occasionally not until 20 months. Since after prophylactic inoculation, with subsequent artificial infection, eight out of nine animals calved before term and developed a higher blood titre, it was considered that neither preparation showed much promise as an immunizing agent. Curative treatment with the chinosol vaccine in an infected herd neither produced any change in reaction titres, nor reduced the number of abortions.—D. N. Spriggs.

I. Metzger, H. J., & Stokes, F. R. (1940). **Incubating Hen's Egg as a Culture Medium for Brucella Abortus.**—*J. Amer. vet. med. Ass.* **96.** 369–371. **1696**

II. de Ropp, R. S. (1944). **The Behaviour of Some Smooth and Rough Strains of** *Brucella abortus* **in the Developing Chick Embryo.**—*J. comp. Path.* **54.** 53–60. **1697**

I. Following Goodpasture & Anderson's report [*V. B.* **8.** 139.] that *Br. abortus* can be cultivated on the chorio-allantoic membrane of the chick embryo, the authors used this medium to investigate (1) the effect of repeated egg to egg transfers on the virulence, cultural characteristics, and antigenic properties of two different strains of *Br. abortus*, and (2) the use of the incubating egg in typing different strains. The two strains used were strain 19 and a recently isolated CO_2-sensitive strain. At the beginning of the experiment, series of g. pigs and eggs were inoculated with both strains and the g. pigs killed and examined after six weeks. The lesions in embryos and g. pigs were noted for comparison with later inoculations. The results showed that after the 11th egg to egg transfer neither of the strains had undergone any change. To investigate the possibility of typing different strains, two series of eggs were inoculated with doses varying from 150 to 13 million organisms and the length of time the embryo lived after inoculation and the lesions produced were recorded. No significant differences were observed in the effects produced by the two strains.

II. Metzger & Stokes [see I] found that a fully virulent strain of *Br. abortus* and strain 19 were equally capable of invading the chick embryo and causing death. As strain 19 is of low virulence, the object of the present experiments was to ascertain whether strains of *Br. abortus* of very different degrees of virulence for the g. pig were all of equal virulence for the nine-day-old chick embryo. The strains studied included strain 544 (McEwen), strain 19, strain 45 (20) (McEwen), Sparrow strain, and Jones strain, the last three being rough strains of reduced virulence. The inoculations into developing eggs were divided into three groups, *viz*, 600 million organisms, 30,000, and 300.

The results confirmed the observations made in I that strain 19 behaved in the chick embryo as a fully virulent strain in causing the death of a high proportion with enlargement of the spleen and lesions in the liver. The three rough strains all proved incapable of producing a fatal infection in the chick embryo, except when inoculated in very large numbers. The data suggested that rough strains are not capable of invading the chick embryo. The amount of infection in spleens and livers of embryos killed by the inoculation is shown in tabular form, and also an experiment to show the rate of invasion by culturing at two and four days after inoculation. A microscopic study of the distribution of *Br. abortus* within the host tissues was also made.—S. J. Gilbert.

*Mannozzi-Torini, M., & Vendramini, R. (1941). Studi sul metabolismo delle Brucelle, 1. L'ossidazione degli aminoacidi da parte della Brucella abortus. 2. Ulteriori ricerche sulla ossidazione degli aminoacidi da parte della B. abortus. [**Metabolism of Brucella. I. Oxidation of Amino-Acids by** *Br. abortus*. **II. Further Research on Oxidation of Amino-Acids by** *Br. abortus*].—*Boll. Ist. sieroter. Milano.* **20.** 4–12 & 13–18. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 499 & 500]. **1698**

I. A suspension of *Br. abortus* in Ringer's solution with phosphate buffer of pH 7·2 serves as catalyst for the oxidative decomposition (involving an oxidative deamination) of the following amino acids :– alanine, asparagine, glutamic acid and cysteine. The decomposition of cysteine differs from that of the other amino acids in that in the preliminary phase the –SH instead of the $-NH_2$ group was split off. Amino acids of the aromatic series are not oxidized by *Br. abortus*.

II. The power of *Br. abortus* to decompose amino acids is not affected by the presence of glucose. Other reducing agents, such as ascorbic acid, and hydrogen sulphide also have no effect. The mechanism of decomposition of cysteine is described.—K. Chodnik.

*Rokke, B. (1941). Gassodem (gassgangren)-infeksjoner hos vare husdyr. [**Malignant Oedema in Domestic Animals in Norway**].—*Norsk Vet.Tidsskr.* **53.** 49–68. [Abst. from abst. in *Tierärztl. Rdsch.* **47.** 519]. **1699**

After a brief review of the diseases caused by pathogenic anaerobes, with special reference to the Norwegian literature, R. gives the result of his own work on the organism of bradsot. Using Zeissler's technique, he isolated *Clostridium chauvoei* four times (three times from cattle and once from a horse), and *Cl. septicum* eight times, sometimes in a mixed infection with other anaerobes. He considered that the latter was invariably the cause of bradsot and was unable to confirm the findings of other workers who isolated *Cl. oedematiens* and *Cl. gigas* from Icelandic material.

—Ann. F. Russell.

Cilli, V. (1942). Identificazione di alcune ceppi di gastro-enterotossiema degli ovini e dei caprini in Eritrea. [**Identification of Enterotoxaemia in Sheep and Goats in Eritrea**].—*Boll. Soc. ital. Med. Igiene trop.* **1.** No. 2. 54–60. [English summary]. **1700**

After investigating a disease of sheep and goats in Eritrea characterized by acute inflammation of the fourth stomach, the peritoneum and kidneys being also sometimes involved, C. concludes, as a result of morphological, cultural, and serological observations, that the organism involved is the " bacillus of malignant oedema ". It is noted that the disease is confined to imported animals and does not occur in indigenous sheep and goats.—U. F. Richardson.

MARSH, H., & TUNNICLIFF, E. A. (1944). **Enterotoxemia in Feedlot Lambs in Connection with an Outbreak of Coccidiosis.**—*J. Amer. vet. med. Ass.* **104.** 13–14. **1701**

About two weeks after the feeding of concentrates to lambs had begun, a proportion of the animals became affected with coccidiosis and some died. When three good lambs died suddenly and without showing any signs of having coccidiosis, autopsies were made. Among the lesions in these cases were "pulpy" kidney and hyperaemia of the small intestine. Cultures from the intestine and the filtered intestinal contents were toxic for mice and were shown to contain *Clostridium welchii* Type D toxin. In contrast, the cultures from a typical case of coccidiosis were not toxic to mice. The unusually early appearance of enterotoxaemia in fattening lambs is explained by the fact that owing to a proportion of the flock being off their food because of coccidiosis, the remainder tended to ingest too much of the rich diet. —J. KEPPIE.

TUNNICLIFF, E. A. (1943). **Persistence of Immunity Against Infectious Necrotic Hepatitis in Sheep Vaccinated with an Alum-Precipitated Toxoid.**—*J. Amer. vet. med. Ass.* **103.** 368–370. **1702**

The degree of immunity in sheep which had been given 5 ml. of alum-precipitated toxoid subcutaneously was tested by the intravenous injection of *Clostridium oedematiens* toxin produced from strains which had been isolated from cases of black disease in sheep. After 1½ years, the sheep survived 34 M.L.D. of toxin. With the passage of time their resistance, as judged by this test, slowly diminished. After four years they still survived the intravenous injection of 12 M.L.D. of toxin. T. concludes that the single dose of toxoid produced lifelong immunity.—J. KEPPIE.

MCKENNEY, F. D., TRAUM, J., & BONESTELL, A. E. (1944). **Acute Coccidiomycosis in a Mountain Gorilla (Gorilla Beringeri) with Anatomical Notes.**—*J. Amer. vet. med. Ass.* **104.** 136–140. **1703**

Coccidioides immitis infection was found in a captive male gorilla, aged 15 years, which died after an illness lasting 45 days. Lesions were present in the liver, spleen, and lungs, and there was generalized enlargement of subcutaneous lymph nodes. The tissue reaction to infection was similar to that of early tubercle formation. The organism was isolated in culture, and its pathogenicity was confirmed by g. pig inoculation.

Examination of the skeleton of the gorilla indicated that the animal had not reached maturity.—I. W. B.

MARSH, H. (1944). **Necrobacillosis of the Rumen in Young Lambs.**—*J. Amer. vet. med. Ass.* **104.** 23–25. **1704**

Necrobacillosis was shown to be the cause of deaths in young lambs which were being reared on the ewe indoors in insanitary sheds. The disinfection of the navel at birth was satisfactory and precluded this from being the path of entry of the infection. In the majority of cases the primary lesion occurred in the mucosa at the junction of the oesophagus with the rumen. Raised ulcers covered with yellowish-white necrotic material were also found in the adjacent wall of the rumen. There were no lesions in the reticulum, omasum, or abomasum. In all cases the liver was infected either with multiple necrotic foci or with a single large necrotic abscess. Smears from the base of the lesions revealed organisms with the morphological characteristic of *Fusiformis necrophorus*.—J. KEPPIE.

POLLOCK, M. R., & KNOX, R. (1943). **Bacterial Reduction of Tetrathionate. (A Report to the Medical Research Council).**—*Biochem. J.* **37.** 476–481. **1705**

It was shown that washed suspensions of *Salmonella paratyphi* B can reduce tetrathionate rapidly and quantitatively to thiosulphate and that the reaction can be followed by direct iodometric titration. The ability to reduce tetrathionate actively appears to be restricted to certain intestinal organisms, including many salmonella but excluding *S. paratyphi* A.

Some biological implications of this reaction are discussed.—R. ALLCROFT.

See also absts. **1852** (enterotoxigenic staphylococci), **1823** (haemolytic streptococci), **1853** (cultivation of tubercle bacilli), **1748** (tests with johnin), **1751** (antigenic complex of *S. typhi-murium*), **1854** (culture of tetanus bacilli), **1771** (bacterial infections in rats), **1868, 1869** (sporothricosis).

DISEASES CAUSED BY PROTOZOAN PARASITES

*BIOCCA, E. (1942). Una osservazione di infezione fetale da *Trypanosoma brucei* nella cavia. **[Intrauterine Infection with *T. brucei* in a Guinea Pig].**—*Riv. Parassitol.* **6.** 176. [Abst. from abst. in *Zbl. Bakt. I. (Ref.)*. **143.** 319]. **1706**

A pregnant g. pig was inoculated with *T. brucei* and, after the development of a heavy blood infection, was slaughtered. No trypanosomes could be detected microscopically in the blood of any of the four foetuses, but when the mixed blood of the four foetuses was inoculated into another g. pig, the latter developed *T. brucei* infection and died after 14 days. The foetuses had been disinfected with tincture of iodine before the collection of their blood.—U. F. RICHARDSON.

MAZZA, S., & ORIBE, H. R. (1943). Investigaciones sobre enfermedad de Chagas. I. La enfermedad de Chagas en el Territorio Nacional Formosa. **[Investigations on Chagas' Disease. I. In Formosa, Argentina].**—*Publ. Misión Estud. Pat. reg. argent.* No. 66. pp. 3–47. **1707**

MAZZA, S., & JAUREGUI, R. B. (1943). Investigaciones sobre enfermedad de Chagas. II. Otras observaciones de primer período de enfermedad de Chagas en Las Lomitas. **[Investigations on Chagas' Disease. II. Early Cases in Las Lomitas, Formosa].**—*Ibid.* pp. 48–52. **1708**

I & II. A general account of the disease in Formosa, Argentina, where a number of human cases was observed. 47% of 2,116 triatomid bugs examined were infected with *Trypanosoma cruzi*. Natural infection with *T. cruzi* was also observed in wild mammals in the area.

Five puppies in Las Lomitas were found to be naturally infected; one of these showed ulcers on the skin, but otherwise appeared to be unaffected, in spite of a heavy blood infestation with *T. cruzi*. In a dwelling where a human case occurred, two kittens and a puppy were found infected.

A foal was experimentally infected by the conjunctival, subcutaneous, and oral administration of an emulsion of triatomids infected with *T. cruzi*; animal inoculation tests gave positive results.

LEVINE, P. P. (1943). **Additional Field Outbreaks of Coccidiosis in Chickens due to *Eimeria brunetti*.**—*Cornell Vet.* **33.** 383–385. **1709**

This paper records the occurrence in three flocks of chickens of coccidiosis with which the new species, *E. brunetti*, was associated. Every precautionary measure was taken to establish the identity of the species. L. believes that a diagnosis of coccidiosis due to *E. brunetti* can be made with certainty if typical gross lesions are produced, and that the occurrence of this

infection in young chickens 8½, 5, and 4 weeks old and the resultant severe mortality place *E. brunetti* in the same class of pathogenicity as *E. tenella* and *E. necatrix*. —C. Horton Smith.

Karaseva, O. A. (1940). Vliyanie ul'trakorotkikh voln na techenie malyarii u ptits. [**Influence of Ultra-Short Waves on the Course of Avian Malaria**].—*Med. Parazitol., Moscow*, **9**. 295–297. **1710**

No influence was observed of ultra-short wave radiation on birds in various stages of infection with naturally and artificially acquired malaria.—A. M.

*Seebauer, K. (1942). Die kartographische Erfassung des Texasfiebers und dessen Überträger in Afrika. [**Geographical Distribution of Bovine *Babesia bigemina* Infection and its Vectors in Africa**].—*Inaug. Diss., Hanover*. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143**. 321]. **1711**

From a study of published information, a map was drawn to show the distribution of the vectors of *Babesia bigemina* infection in Africa. This showed that the disease occurs throughout Africa except in desert areas and some of the higher mountainous regions, and that it occurs not only in low-lying forest and bush areas, but also in savannah country and upland pastures wherever the annual rainfall is 400–500 mm. In native cattle mortality is low as they acquire infection and immunity shortly after birth, but losses in imported cattle are heavy. The vectors are given as *Boophilus decoloratus* in South and equatorial Africa, *B. calcaratus* in North Africa, *B. australis* in the south-eastern part of the Cape Province, *Rhipicephalus appendiculatus* in East, West, and South Africa, *R. bursa* in North Africa, and *R. evertsi* in South Africa.—U. F. Richardson.

*Kühlhorn, K. (1942). Seuchenkarte des Küstenfiebers in Afrika. [**Distribution of East Coast Fever in Africa**].—*Inaug. Diss., Hanover*. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143**. 322]. **1712**

As a result of a study of the distribution of East Coast fever and its vectors in Africa, it is concluded that the disease occurs most commonly in low-lying districts with a heavy rainfall, but the distribution of the disease and of the vectors is not identical as the vectors may occur in areas which are not suitable for cattle. The vectors are given as *Rhipicephalus appendiculatus*, *R. evertsi*, *R. simus*, *R. capensis*, and *R. nitens*, whilst the disease is said to occur in Southern Rhodesia, the Transvaal, Natal, British Somaliland, Tanganyika Territory, and the Ivory Coast. [Neither the list of vectors nor that of the infected areas given above is complete.]—U. F. Richardson.

See also absts. **1761**, **1825**, **1868**, **1870** (trypanosomiasis), **1701** (coccidiosis in lambs), **1756** (coccidiosis in wild rabbits and hares), **1826** (piroplasmosis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Michelsen, E. (1943). Om Virusarternes Dyrkning. [**The Culture of Viruses**].—*Maanedsskr. Dyrlaeger.* **55**. 457–470. **1713**

This is a general and instructive review, dealing with human and animal pathogenic viruses and their artificial culture. It contains a table showing the date, medium used, and worker's name in connexion with the first successful attempts to grow 14 of the more important viruses.—J. E.

Vrla, J. (1939). Slintavka u ludi. Aphthae epizooticae. [**Foot and Mouth Disease in Man**].—*Bratislavské lekárs. List.* **19**. 231–240. [English, French and German summaries]. **1714**

Four selected cases of F. & M. disease in human beings, out of some which occurred during the epidemic outbreak in 1938, are described. After a short period of incubation, very painful diffuse lesions, covered by pseudomembranes, appeared on the mucous membrane of the mouth, tongue, and palate. In the case of children, the lesions were localized on the tongue. Typical vesicles were observed in the mouth of one adult. As a whole the disease was of benign character. —J. Z.

Andreev, P. N., & Uzunov, N. N. (1940). Materialy po izucheniyu bolezni Aueshki i sposobov bor'by s nei. [**Study and Control of Aujeszky's Disease**].—*Veterinariya, Moscow*. No. 2. pp. 33–46. [French summary]. **1715**

Seven strains of virus were isolated on various farms and were found to be identical. Passaging through 20 rabbits did not alter the virulence of the virus. 5% chlorinated lime and 20% slaked lime destroyed the virus instantly, and 0·5% NaOH solution after 30 sec. The virus was isolated from the central nervous system, spleen, lungs, and kidneys of naturally and experimentally infected animals. It was found in the urine of rabbits and grey rats only; it could not be detected in the urine of eight infected piglets examined. The virus was also isolated from aborted and mummified foetuses from a sow which did not show any clinical signs of the disease. A mild form of the disease was artificially produced in piglets by various routes of inoculation. Cats and dogs developed symptoms 3–5 days after subcutaneous inoculation and by feeding with infected meat. Rabbits showed itching for 5–8 hours at the seat of injection 3–4 days after inoculation. After intranasal application, the itching occurred in the gluteal area, but in some cases it was absent. G. pigs showed symptoms after 3–4 days, but no itching was observed. White rats became infected only after intraocular inoculation; symptoms were itching and paralysis of the extremities; grey rats were infected by the subcutaneous and intranasal routes and *per os*.

A detailed discussion is given of the clinical symptoms, P.M. findings, histological changes, and epizoology of the disease. In piglets the disease was characterized by nervous symptoms, but in adult pigs it resembled influenza. The losses among piglets averages 40–50% and may reach 90–95%. Piglets of one month old were those most affected; hyperimmune serum proved to be effective for treatment of piglets.—A. Moldawsky.

Solomkin, P. S. (1940). Poluchenie i ispytanie syvorotki protiv bolezni Aueshki svinei. [**Aujeszky's Disease Antiserum for Swine**].—*Veterinariya, Moscow*. No. 2. pp. 47–56. [French summary]. **1716**

Potent antiserum was prepared by hyperimmunizing pigs with virus obtained from a mixture of the brain, liver, spleen, and lungs of rabbits dead from Aujeszky's disease.

Cattle of all ages were found unsuitable serum-producers owing to a high susceptibility even to the smallest doses of virus. No accumulation of immune bodies in their serum could be produced by killed or attenuated virus. Rabbits were found unsuitable as experimental animals.—A. Moldawsky.

Remlinger, P., & Bailly, J. (1941). Influence de l'anesthésie sur la transmission de la rage par voie pulmonaire. [**Influence of Anaesthesia on Transmission of Rabies through the Lungs**].—*Ann. Inst. Pasteur*. **67**. 465–467. **1717**

Intranasal instillation of a 1 : 100 emulsion of rabies virus, extracted from a dog, infected 33% of mice sub-

mitted to ether anaesthesia, but only 4% of mice which were not anaesthetized. The lungs of anaesthetized mice, sacrificed immediately after the nasal instillation, were found to contain rabies virus. It is concluded that the anaesthetic paralyses the natural reflexes and thus allows viruses or organisms given intranasally to reach the lungs.—U. F. RICHARDSON.

TROPA, E. A. (1942). Ensaios sôbre vacinas antirábicas caninas homólogas. [**Trials with Homologous Antirabic Vaccines**]. pp. 111. Oporto. [French summary]. **1718**

The importance and practical value of vaccination in the control of rabies are discussed. The properties of fixed virus and the cytological and histological changes produced in the nervous system of g. pigs, rabbits, and dogs by the rabies virus are described. Several pages are devoted to the differential diagnosis between infection with rabies virus and other viruses with which it might be confused.

The antirabic power of the serum of inoculated dogs is examined by means of *in vitro* neutralization, followed by biological tests in the g. pig and rabbit.

T. describes the preparation of homologous vaccines, and deals with the differences in antigenic power of the various vaccines, and the dangers associated with the injection of large amounts of vaccine, live or dead. He insists, nevertheless, that the vaccination dose must be large enough to confer complete immunity.

—I. W. BROCKLEHURST.

DE FREITAS, L. C. R. (1943). A Câmara Municipal do Porto e a profilaxia da raiva. [**Control of Rabies in Oporto**].—*Rev. Med. vet., Lisboa.* **38.** 113–161. **1719**

A review is given of the evolution of the prophylaxis of rabies in all countries.

In Oporto, control consists in the compulsory registration and vaccination of dogs and the apprehension of stray dogs.

No case of rabies has occurred in Oporto since 1928. The number of dogs apprehended in 1930 was 1,724, 44 of which were suspected of being affected with rabies and were destroyed. All were negative to tests carried out. The number of stray dogs captured in 1939 rose to 2,705, 70 of which were rabies suspects. Tests showed that none of these dogs was affected.

In 1940, it was decided to apprehend stray cats as well as dogs and 1,433 were taken to the municipal depot. During that year, 143 dogs and 10 cats were kept under observation but none proved rabid.

A description of the municipal depot is given.

—MILLER WATSON.

SIGURDSSON, B. (1943). **The Yield of Rabies Virus in the Chick Embryo.**—*J. exp. Med.* **78.** 341–345. **1720**

Hitherto the poor yield of virus has rendered tissue culture and the chick embryo unsuitable sources of rabies vaccine. An attempt to induce greater multiplication of the virus in chick embryos is described. To inoculate chick embryos, two strains of rabies virus were used (Pasteur and 15811) in the form of a suspension of mouse brain. Inoculation was made either on to the chorio-allantoic membrane or into the cerebrum of the embryo. After varying periods the eggs were harvested and tested for virus by titration in young mice. The 50% mortality end-point was calculated for each titration. Subsequent intracerebral inoculation of the 15811 strain into eight-day embryos showed that in 5–6 days the virus reached a titre of 10^{-5} to $10^{-6\cdot5}$, which is within the limits set by WEBSTER in his preparation of material suitable for vaccine.—J. M. PETERS.

TAYLOR, A. R., SHARP, D. G., MCLEAN, I. W., Jr., BEARD, D., BEARD, J. W., DINGLE, J. H., & FELLER, A. E. (1943). **Purification and Character of the Swine Influenza Virus.**—*Science.* **98.** 587–589. **1721**

Recent investigations by TAYLOR *et al.* [*V. B.* **14.** 120 & 193.] have defined the particle size of influenza A and B viruses respectively.

Experiments of a similar nature carried out on egg-propagated swine influenza virus indicated that the size of the virus particle lies between 78·3 mμ and 81·5 mμ.—R. E. GLOVER.

AGAPOV, S. I. (1940). Opyty aktivnoĭ i passivnoĭ immunizatsii pri inflyuentse svineĭ. [**Active and Passive Immunization against Swine Influenza**].—*Veterinariya, Moscow.* No. 2. pp. 57–59. [French summary]. **1722**

Subcutaneous inoculation into piglets of virus obtained from the lung tissue of an older pig affected with the disease failed to produce clinical symptoms and gave active immunity against subsequent exposure to, and experimental infection with, swine influenza. Intranasal application of influenza antiserum provoked a passive immunity which lasted for about 12 days.

—A. MOLDAWSKY.

IVANOV, B. G., & PRISELKOVA, D. O. (1940). K morfologii vklyucheniĭ v nervnykh kletkakh pri entsefalomielite loshadeĭ. [**Morphology of Inclusion Bodies in Equine Encephalomyelitis**].—*Veterinariya, Moscow.* No. 2. pp. 144–147. [French summary]. **1723**

In about 30% of naturally infected horses, inclusion bodies were found in certain sections of the brain, usually singly and in small numbers. They were homogeneous, acidophile, oval or round formations in the cell plasma, resembling Joest-Degen bodies. Similar formations, but smaller in size, were also occasionally found in nuclei.

The inclusion bodies occurred more constantly and in greater numbers in animals experimentally infected with E.E. virus than in naturally infected animals. Morphologically, they differed in various animals. In rabbits and also in a hare, they resembled those met with in naturally infected horses, but occasionally bodies with basophile granulation were present. Those demonstrated in horses and dogs, however, closely resembled Negri bodies. In pigs and sheep, inclusion bodies were rarely found and then only after the inoculation of strain no. 5 virus.

Twenty-nine diagrams are included.—A. M.

KOKURICHEV, P., & DEDERKO, V. (1935). K voprosu o patogeneze meningitopodobnovo zabolevaniya loshadeĭ. [**On Pathogenesis of Equine Encephalomyelitis**].—*Trud. Ural'sk. vet.-zootekh. Inst.* No. 1. pp. 17–25. **1724**

The authors carried out many P.M. and histological examinations of the organs of horses infected naturally and experimentally. They conclude that the severity of the lesions depends on the virulence of the virus, the natural resistance of the host, and the duration of the disease. On reaching the blood stream the virus produces fatty degeneration and necrosis in various organs. There is also a reaction of the vascular system. In the first stages of infection, the lesions are characterized by acute parenchymatous inflammation which is occasionally accompanied by sero-haemorrhagic exudation ; in the later stages the inflammation has a proliferative character which is especially pronounced in those organs containing many reticulo-endothelial cells.

—A. MOLDAWSKY.

SHIRINKIN, A. (1935). K izucheniyu kartiny krasnoĭ krovi pri meningitopodobnykh zabolevaniyakh loshadeĭ v byvsheĭ Ural'skoĭ oblasti. [**Studies on Red Blood Corpuscles in Horses with Equine Encephalomyelitis in Ural Province**].—*Trud. Ural'sk. vet.-zootekh. Inst.* No. 1. pp. 26–31. **1725**

There was haemolytic anaemia which later assumed the character of an aplastic anaemia accompanied by anisocytosis, poikilocytosis, and increased fragility of the erythrocytes. There was also hyperbilirubinaemia. The haemoglobin content was reduced and the colour index increased.—A. MOLDAWSKY.

SUMANEEV, T. I. (1935). Kartina beloĭ krovi pri meningitopodobnykh zabolevaniyakh. [**White Blood Constituents in Equine Encephalomyelitis**].—*Trud. Ural'sk. vet.-zootekh. Inst.* No. 1. pp. 32–34. **1726**

Considerable leucocytosis, eosinophilia (11%), and occasionally monocytosis were observed. There were also changes in neutrophiles—a "shift to the left"—basophilia, and granulation.—A. MOLDAWSKY.

MOTOVILOV, K. A. (1935). Izmeneniya mochi pri meningitopodobnykh zabolevaniyakh loshadeĭ i ikh klinicheskoe znachenie. [**Changes in Urine in Equine Encephalomyelitis**]. — *Trud. Ural'sk. vet.-zootekh. Inst.* No. 1. pp. 35–40. **1727**

M. examined 1,635 urine samples from areas in which E.E. was prevalent, 190 of the samples being abnormal. In early and mild cases, bile pigments and bile acids were present, while in more advanced cases, albumin, kidney epithelial cells, casts, and leucocytes were present. Blood pigments and amino acids were found occasionally.

In M.'s opinion, in the latent stage of infection, which for a considerable time precedes the clinical symptoms, bile pigments are present in the urine, and their presence may be of some diagnostic value.—A. M.

MITCHELL, C. A., & PULLIN, J. W. (1943). **Examination of Sera from Persons in Manitoba, Ontario and Quebec for Neutralizing Antibodies (Western Type) of Encephalomyelitis.**—*Canad. J. publ. Hlth.* **34.** 419–420. **1728**

The study was made in order to determine the possibility of subclinical infection existing in human beings resident in districts in Manitoba where the disease in horses had been prevalent. Among 1,013 samples of human sera collected at random, 192 or 18·95% neutralized E.E. virus. As controls, 101 samples were obtained from residents of Ontario, where the disease had occurred only in one portion of the Province, and 50 samples from residents of Quebec where no case of the disease in horses had been reported. None of the samples from Quebec exhibited neutralizing properties, while two from those collected in Ontario did. It is of interest to note that one of these was from a former resident of New Ontario, the district in which E.E. had occurred in horses. The other sample was from a native of Poland whose movements after arrival in Canada could not be traced.—L. M. HEATH.

*DE VRIES, J. P. (1941). [**Coital Exanthema in Horses**]. —*Tijdschr. Diergeneesk.* **68.** 1027–1031. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 362]. **1729**

A serious and rapidly spreading outbreak involving 24 mares covered by one stallion is described. A few mares showed systemic disturbance with high temperature and widespread oedema. Three foals developed ulcers on the nose and lips, and two cows were also affected. The disease was transmissible to man, causing a vesicular eruption on the arms with high fever in two cases.—ANN F. RUSSELL.

NAIR, K. S., KRISHNAMURTI, R., & KALYANASUNDARAM, G. S. (1942). **A Study on Desiccated Goat Spleen Vaccine as an Immunizing Agent against Rinderpest.** —*Indian J. vet. Sci.* **12.** 305–317. **1730**

Tissue (spleen) virus from three goats, collected on the fourth day after inoculation with rinderpest virus, was desiccated over calcium chloride in the refrigerator. Four batches of the virus were prepared and tested for potency on two buffalo calves, in doses of 0·0025 g. daily. The vaccine was found to be potent for three days when kept at room temperature (89·2°–101·8°F.).

In another experiment, three groups comprising a total of 46 adult buffaloes received doses of 0·0025, 0·00125, and 0·000625 g. respectively of desiccated virus which had been stored in the refrigerator for 13 and 14 days. All except five animals reacted and two died. Similar trials in buffalo calves showed that doses below 0·0025 g. set up no reaction and conferred no immunity.

For field work, the virus was transported on ice; the results of vaccination of a large number of cattle and buffaloes suggest that antiserum should be used, particularly in buffaloes, to check undesirable reactions. —J. A. IDNANI.

CILLI, V. (1942). Il virus della peste bovina passato in serie sulla capra in Eritrea. [**Rinderpest Virus Serially Passaged in Goats in Eritrea**].—*Boll. Soc. ital. Med. Igiene trop.* **1.** No. 1. 60–67. **1731**

In investigating the practicability of using a goat-adapted strain of rinderpest virus for the immunization of cattle in Eritrea, it was found that the susceptibility of goats over 12 months old was irregular, perhaps due to their having acquired immunity by contact in early life. Eighty-one passages of a cattle virus through goats were effected in animals of 6–12 months old, 80% of the animals giving a febrile reaction between the third and fifth days after inoculation, and usually exhibiting inflammation of the mucous membranes of the head. Even when appreciable reaction was absent, the presence of virus could be demonstrated by the subinoculation of calves. Blood from infected goats from the first to the 13th passage regularly infected calves which later proved immune to bovine virus. Between the 18th and 23rd passages, only irregular infection of calves resulted from goat blood inoculation, and some of the animals failing to react proved susceptible to bovine virus. From the 25th passage onwards, no reaction occurred in calves on the inoculation of goat virus and no immunity to bovine virus was conferred on them.—U. F. R.

KOHL, K. (1943). Simultanimpfversuche gegen Schweinepest mit einem an Aluminiumhydroxyd adsorbierten Virus. [**Vaccination against Swine Fever with Virus Adsorbed on Aluminium Hydroxide**].— *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 9–10. **1732**

K. refers to a method reeently used in Venezuela [no reference given] for adsorbing S.F. virus on to aluminium hydroxide. He tested a vaccine prepared by this method on 25 pigs and compared its efficacy with the usual serum-virus vaccine, which was used on 23 controls. Two of the pigs given adsorbed virus died and a third had to be killed. One pig of the control group died. Febrile reactions were more marked in the group given adsorbed virus. K. does not, therefore, recommend this vaccine.—D. L. ROBARTS.

SCHLOTTHAUER, C. F. (1943). **Green's Modified Canine Distemper Virus Vaccine: A Clinical Study of Its Efficiency.**—*J. Amer. vet. med. Ass.* **103.** 290–292. **1733**

GREEN (1939) found that after 54 serial passages in ferrets distemper virus no longer caused disease in dogs but produced an active immunity.

The efficacy of the vaccine was tested by S. in kennels where distemper was constantly present; all susceptible dogs brought into them developed the disease in less than three weeks. It was confirmed that the virus vaccine was not virulent for dogs; 2·5 and 7·5 mg. doses of the dried modified distemper virus vaccine did not protect the larger breeds of dogs adequately against

natural canine distemper if exposure was immediate and severe. The dose of 7·5 mg. was more efficacious than the 2·5 mg. dose. Doses of 15 mg. gave adequate protection in all instances.

Experimentally, good results were obtained when the vaccine was administered on the same day as the dogs were exposed to severe natural distemper infection and the exposure continued for 30 days following vaccination.—JOHN FRANCIS.

DALLDORF, G. (1943). **Lymphocytic Choriomeningitis of Dogs.**—*Cornell Vet.* **33.** 347–350. **1734**

The observation that the virus of choriomeningitis in combination with distemper virus could be propagated in dogs [see DALLDORF—*V. B.* **10.** 674.], suggested that unidentified disorders of the central nervous system, especially those following attacks of distemper, might be due to the former agent.

Inoculation of choriomeningitis virus into puppies produced mild symptoms of central nervous system involvement. After recovery, the majority showed complement-fixing and neutralizing antibodies in their serum. The virus was not recovered, however, from the tissues of 32 dogs diagnosed as affected with nervous complications of distemper, whilst 331 serum samples from adult dogs, taken at random, contained no complement-fixing antibodies. On the other hand, tests made with normal puppies placed in contact with artificially infected dogs indicated that the virus induced a transmissible inapparent infection revealed by serological changes.—R. E. GLOVER.

*JANSEN, J. (1941). **[Rabbit Pest : Preliminary Note].**—*Tijdschr. Diergeneesk.* **68.** 967. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 361]. [See also *V. B.* **12.** 584]. **1735**

A new filtrable virus was demonstrated in connexion with deaths in a rabbitry. It could be transmitted intranasally and subcutaneously and could be grown on chick-embryos.—ANN F. RUSSELL.

MELNICK, J. L. (1943). **Detection of the Virus of Mouse Encephalomyelitis in the Intestines of Normal Kangaroo Rats.**—*J. Immunol.* **47.** 231–236. **1736**

A virus related to Theiler's mouse encephalomyelitis virus, was found in the intestines of normal kangaroo rats (*Dipodomys merriami*). These rats had been housed for over a year in a laboratory also inhabited by normal and poliomyelitis-infected monkeys and by albino mice which were proved to be intestinal carriers of Theiler's mouse encephalomyelitis virus.—I. W. B.

*BOS, A. (1942). Weer nieuwe gevallen van eendenpest. **[Some New Cases of Duck Pest].**—*Tijdskr. Diergeneesk.* **69.** 372. [Abst. from abst. in *Maanedskr. Dyrlaeger.* **55.** 436]. **1737**

Early in 1940 a disease of ducks appeared in Holland. It was proved not to be salmonella infection and resembled a disease described by BAUDET in 1923 as a virus disease.

Symptoms were acute offensive diarrhoea and death in the course of a week ; the mortality rate was 80–90%. P.M. findings were fibrinous or fibrino-purulent peritonitis, swollen spleen, often oophoritis with haemorrhagic and shrunken follicles, petechiae on the heart in half the cases and occasionally salpingitis, diphtheritic inflammation of the cloaca and oesophagus and haemorrhages of the trachea, liver, crop, and intestine.

Fowls and other birds living in contact with the affected ducks remained well, and fowls, pigeons, rabbits, g. pigs, rats, and mice were refractory to artificial infection. Ducks, however, could be easily infected with filtered or unfiltered matter from natural lesions or exudates.

The virus was stable for one month in 50% glycerin at 5°C.—J. E.

I. DINGLE, J. H., ABERNETHY, T. J., BADGER, G. F., BUDDINGH, G. J., FELLER, A. E., LANGMUIR, A. D., RUEGSEGGER, J. M., & WOOD, W. B., Jr. (1943). **Primary Atypical Pneumonia, Etiology Unknown.**—*War Med., Chicago.* **3.** 223–248. **1738**

II. DINGLE, J. H., ABERNETHY, T. J., BADGER, G. F., BUDDINGH, G. J., FELLER, A. E., LANGMUIR, A. D., RUEGSEGGER, J. M., & WOOD, W. B., Jr. (1944). **Primary Atypical Pneumonia, Etiology Unknown. (Part I).**—*Amer. J. Hyg.* **39.** 67–128. 1 appendix. **1739**

I. Sixty-nine cases of primary atypical pneumonia in man were subjected to a detailed study. Information is given on the clinical aspect of the disease, differential diagnosis, pathological changes, and epidemiological findings.

In most instances attempts to isolate a causal agent were unsuccessful. The virus of meningo-pneumonitis was recovered, however, from four patients (twice from nasal washings and twice from sputa). In many instances a transmissible, acute, haemorrhagic pneumonia was produced in the cotton rat but no obvious increase in pathogenicity occurred on passage. It is possible that the meningo-pneumonitis virus was responsible for the illness in the patients, but confirmatory evidence by complement-fixation tests on acute and convalescent sera was not forthcoming.

II. A similar report on the 69 cases referred to in I, with special reference to clinical differentiation.

—R. E. GLOVER.

LAEMMERT, H. W., Jr., & MOUSSATCHÉ, H. (1943). **Adaptation of Yellow Fever Virus to Young Chickens by Serial Brain to Brain Passages.**—*J. infect. Dis.* **72.** 228–231. **1740**

It has been shown that the Asibi strain of yellow fever virus can readily be established in chick embryos. In the present study, the Asibi strain of monkey passage yellow fever virus could not be established in young chicks by brain to brain passage. This strain, however, of yellow fever virus which had undergone 19 passages in tissue culture of the Maitland type and thereafter 22 passages in the developing chick embryo was readily established in young chicks and was passaged 102 times by direct brain to brain transfers. Young chicks inoculated with this passage virus never showed signs of encephalitis. During the course of the passages, the virus lost its power, by the subcutaneous route, to produce fatal infection in rhesus monkeys, with viscerotropic lesions, but when inoculated intracerebrally into these animals it produced a fatal encephalitis. Although the virus had lost its viscerotropism for rhesus monkeys, the incubation period in mice after intracerebral inoculation was not shortened.—JOHN FRANCIS.

WAGENER. (1943). Vergleichende Aetiologie und Epidemiologie der Rickettsiosen bei Mensch und Tier. **[Aetiology and Epidemiology of Rickettsiasis in Man and Animals].**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 53. Discussion p. 55. **1741**

It is pointed out that the majority of the rickettsial infections of man and animals are transmitted by anthropod vectors, and that the rickettsia of man are usually associated with an animal carrier host, so that the veterinarian becomes concerned with them. The following list of rickettsial infections of animals is given, *viz*, *R. conjunctivae*, *R. ruminantium*, *R. canis*, *R. melophagi*, and rickettsia of bisons. It is considered that these animal rickettsiases differ from those of man in failing to give a Weil-Felix reaction, and in failing to confer a solid immunity, the infected animals remaining carriers.—U. F. RICHARDSON.

I. Mitscherlich, E. (1943). Die Kerato-Conjunctivitis infectiosa des Schafes in Deutschland und ihre Beziehungen zur Kerato-Conjunctivitis infectiosa des Rindes. **[Infectious Kerato-Conjunctivitis of Sheep in Germany, and its Relationship to Infectious Kerato-Conjunctivitis of Cattle].**—*Arch. wiss. prakt. Tierheilk.* **78.** 241–244. **1742**

II. Rudolf, J., & Zoller, H. (1943). Vorläufige Mitteilung über das Vorkommen von "Rickettsien" bei der infektiösen Kerato-Konjunktivitis der Rinder und Gemsen im Gau Tirol-Vorarlberg. **[Preliminary Notice of the Occurrence of Rickettsia in Infectious Kerato-Conjunctivitis in Cattle and Chamois in Tyrol-Vorarlberg].**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* April 30th. 128–129. **1743**

III. Mitscherlich, E. (1943). Die Kerato-Conjunctivitis infectiosa des Rindes und Schafes. **[Infectious Kerato-Conjunctivitis in Cattle and Sheep].**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 53–55. Discussion p. 55. **1744**

I. The occurrence is recorded of infectious conjunctivitis of sheep in Germany associated with a rickettsia, probably identical with *R. conjunctivae*. Discharge from the eyes of naturally infected sheep or cattle applied to the lightly scarified conjunctiva of the heterologous animal produced a kerato-conjunctivitis similar to the natural disease, with the appearance of rickettsia. Support is thus given to the theory that the same causal organism is involved in cattle and sheep.

II. Chamois in the Tyrol are sometimes afflicted with blindness, and a rickettsial conjunctivitis occurs in the mountain cattle. Difficulty in getting fresh material from chamois prevented earlier workers from definitely establishing the occurrence of a rickettsial conjunctivitis, as the cell inclusions took a reddish-yellow colour instead of typical rickettsial staining. When fresh chamois material was obtained, typical rickettsial inclusions were observed in animals with kerato-conjunctivitis.

III. Most typical rickettsia are transmitted only by insects and there has previously been no evidence of this method of transmission in human trachoma or kerato-conjunctivitis of animals. In the latter condition, research showed that the infective agent does not survive outside the body more than 24 hours, and though it can be conveyed by *Musca domestica* and *Stomoxys calcitrans*, these flies do not remain infective for more than 24 hours. They are probably important as direct transmitters, but there is no cyclical stage. It appears that the disease spreads by direct contact in infected herds, and although acridine dyes are said to be efficacious in the treatment of individual animals, the freeing of the herd is a difficult problem, as recovered animals remain carriers. Rickettsial conjunctivitis has been observed in cattle, sheep, chamois, goats, swine, and fowls, but it is uncertain whether the same organism is involved in all these animals.

In the discussion which followed this paper, it was suggested that the inclusion bodies of swine fever might be ocular rickettsia. In a discussion of the pathology of the condition, it was pointed out that both eyes are usually involved, and that although the cornea is usually affected, rickettsial inclusions do not occur in corneal cells or tissue.—U. F. Richardson.

*Zahmow, W. (1942). Seuchenkarte des Herzwassers in Afrika. **[Distribution of Heartwater in Africa].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **143.** 322]. **1745**

The distribution of *Amblyomma hebraeum* and *A. variegatum* and of *Rickettsia ruminantium* infection in Africa is mapped out. Whilst *A. hebraeum* is confined to South Africa, *A. variegatum* extends from South Africa to the Sudan. Nine centres of heartwater are recognized by Z., it being supposed that the prevalence of the disease is limited by climatic and soil conditions.
—U. F. Richardson.

Davis, G. E. (1943). **Experimental Transmission of the Rickettsiae of the Spotted Fevers of Brazil, Colombia, and the United States by the Argasid Tick** *Ornithodoros nicollei.*—*Publ. Hlth Rep., Wash.* **58.** 1742–1744. [Author's summary copied *verbatim*]. **1746**

The argasid tick *Ornithodoros nicollei* engorged in the first nymphal stage on guinea pigs infected with the spotted fevers of Brazil, Colombia, and the United States, respectively, subsequently transmitted the specific agents by feeding on fresh guinea pigs. The ticks remain infective throughout the nymphal and adult stages and transmit the rickettsiae of Brazilian and Colombian spotted fever through the egg to the next generation.

Observations suggest that larvae may be the most efficient transmitters as they attach firmly while ticks in the later stages are easily dislodged. Furthermore, evidence of infection is apparent earlier following the larval feeding than following feeding in the later developmental or adult stages.

As this tick is parasitic on man and dogs, it may be considered a potential vector in Mexico.

See also absts. **1827** (equine encephalomyelitis), **1868-69** (rinderpest), **1828, 1844** (treatment of virus diseases of chickens).

IMMUNITY

Pascher, F., Sulzberger, M. B., & Satenstein, D. L. (1943). **Histologic Studies of Reactions to Intracutaneous Tests in Allergy of Infection in Humans.**—*J. Immunol.* **46.** 195–206. **1747**

The histopathological response to the intradermal injection of oidiomycin, trichophytin, Koch's Old Tuberculin and P.P.D. tuberculin was found to be uniform and was characterized by a simple inflammation, chiefly of the cutis, during the first ten days. From 2–5 weeks after injection, the reactions varied. The tuberculins produced tubercles and tuberculoid structures, while the reactions to the fungal extracts showed little change from the earlier response.

The histological reactions to the tuberculins resembled in some instances lupus vulgaris, in others erythema induratum and in one case, granuloma annulare.—I. W. Brocklehurst.

Vishnevskiĭ, P. P. (1940). Paratuberkulin i rezul'taty evo proverki. **[Tests with Johnin].**—*Veterinariya, Moscow.* No. 2. pp. 3–17. [French summary]. **1748**

Details are given of the preparation of johnin, the reaction produced by double intradermal testing, and the reading of this reaction. V. claims that johnin prepared from a standard strain of *Mycobacterium johnei* grown upon a synthetic medium described by him has many advantages when compared with johnin prepared in other media. In animals infected with acid-fast saprophytes, or having sensitive skins or being affected with various skin diseases, johnin does not produce specific reactions. Occasionally, reactions have occurred in animals with TB. Many animals in the advanced clinical stages of Johne's disease do not react. V. considers that the test, as he carried it out, was 98% reliable. The execution and interpretation of the test

require expert skill and knowledge; the work must, therefore, be done by veterinarians.—A. MOLDAWSKY.

GLOVER, R. E. (1943). **The Estimation of Glycerol in Johnin.**—*J. comp. Path.* **53.** 256–267. **1749**

The utilization of glycerol by *Mycobacterium johnei* during its growth on Henley's synthetic medium, as determined by the Malaprade periodate oxidation method, involved a fall from the initial level of 7% to about 2% after incubation of 11–16 weeks.

Certain batches of heat-concentrated johnin showed loss of potency on cold storage and this was associated with low glycerol content in the final product. The addition of glycerol to heat-concentrated johnins, to a level of 5% before evaporation, is suggested.

[The final glycerin content of the heat-concentrated synthetic medium tuberculin issued by the U.S.A. Bureau of Animal Industry is not high, but the keeping qualities are good. The P.P.D. content of 15 samples of heat-concentrated johnin from various sources, analysed by the Ministry of Agriculture, was found to vary enormously despite very high glycerol content.] —H. H. GREEN.

KULKA, A. M. (1943). **Studies on Antibody-Antigen Mixtures. II. The Effect on Normal Living Excised Tissue and Its Dependence on the Presence of Free Antibody in the Mixture.**—*J. Immunol.* **46.** 235–238. [For previous part, see *V. B.* **12.** 540]. **1750**

When pneumococcal antiserum and corresponding antigen were mixed in such proportions that all free antibody was precipitated, neither the precipitate nor the supernatant fluid caused contraction of the normal g. pig uterus. For contraction to take place, the mixtures had to contain sufficient free antibody in solution.

Normal g. pig uteri were bathed in antibody-containing serum for from 1–5 min., after which the serum was drained off. If the antigen was then added in adequate amounts, the horns contracted, indicating adsorption of antibody to the tissue.—I. W. B.

FREEMAN, G. G. (1943). **The Components of the Antigenic Complex of *Salmonella Typhimurium*. Addendum on Examination in the Ultracentrifuge.** [Addendum by OGSTON, A. G.]—*Biochem. J.* **37.** 601–614. **1751**

The nature of the components of the antigenic complex of *S. typhi-murium* was investigated using methods similar to those previously employed for the study of *S. typhi* [FREEMAN & ANDERSON (1941); FREEMAN (1942)]. The antigenic complex was obtained by tryptic digestion of dried organisms prepared from a synthetic medium culture of an O strain which was free of Vi antigen. By means of ethanol and ammonium sulphate fractionation from aqueous solution, it was obtained in a form believed to represent a chemical entity.

By acetic acid hydrolysis, the following four components were obtained from the purified complex :– (a) a specific polysaccharide (69%), (b) an insoluble conjugated protein (16%), (c) a mixed lipid fraction (3–4%), and (d) an alcohol-soluble acetyl-polysaccharide (about 8%). The specific polysaccharide was non-antigenic, free from nitrogen, and yielded 31% *d*-glucose, 21·5% *d*-mannose, and 19% *d*-galactose on hydrolysis. Dissociation of the antigenic complex by precipitation from weakly alkaline solutions yielded a small amount of an amphoteric protein and a non-antigenic "undegraded polysaccharide". This latter substance reacted specifically to *S. typhi-murium* antiserum to high dilutions and possessed the power of forming complexes with proteins, *e.g.* edestin, human pseudoglobulin, casein, gliadin, and rabbit myosin and with the conjugated proteins of *S. typhi-murium* and *S. typhi* Ty 2. These artificial complexes were stable and no longer precipitable by acidic protein precipitants.

Examination in the Svedberg oil-turbine centrifuge revealed that (1) "degraded" polysaccharide was fairly homogeneous with a not very asymmetrical shape of particle (less so than *S. typhi* polysaccharide) and a minimum molecular weight of 3,600; (2) "undegraded" polysaccharide contained at least three molecular species, one of which might be identical with "degraded" polysaccharide, (3) "artificial" horse-serum-albumin-polysaccharide complex contained two main components, the results giving clear evidence of complex formation; (4) bacterial antigenic complex was similar to the artificial complex, though possessing a much greater sedimentation rate. Its molecular weight was apparently in the region of $1{\cdot}5 - 2{\cdot}5 \times 10^6$.

—J. LOCHIEL MCGIRR.

FRASER, D. T., MACLEAN, D. L., ORR, M. D., PLUMMER, H. C., & WISHART, F. O. (1943). **Tetanus Toxoid and its Use for Active Immunization.**—*Canad. J. publ. Hlth.* **34.** 406–414. **1752**

A medium of veal infusion and hog-stomach autolysate gave a tetanus toxin of high titre. Reactions of an anaphylactic nature have not been reported following use of the toxoid made therefrom. Individuals receiving three doses of tetanus toxoid had a higher antitoxin response than those receiving two doses of the same toxoid in the same period, *viz*, six weeks. A secondary stimulus ten weeks after the primary series of inoculations caused the antitoxin titre to rise within nine days in 85% of the 20 persons tested.—J. L. BYRNE.

*AMBROSI, F., & STOLFI, G. (1942). Sulla velocità di conduzione della tossina tetanica attraverso i nervi e sulla azione della anestesia su di essa. Ricerche sperimentali. **[Rate of Travel of Tetanus Toxin Along Nerves and the Effect on this of Anaesthesia].**—*Policlinico Sez. prat.* **49.** 237–244 [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 151]. **1753**

The authors found that tetanus toxin penetrates largely along the nerves. The rate of travel in the ischiatic nerve of the g. pig was not affected by nerve block with anaesthetics, but diffusion of the toxin was influenced by circular nerve block at the base of the thigh. Emulsions of nerve tissue from above and below the block were injected into mice. The toxin was demonstrated in the nerve below the block.—A. F. R.

MUCCIOLO, P. (1940). A prova de precipitação em inspeção de carnes—ação do ácido ascórbico na preparação de sôros de alto título. **[The Precipitin Test in Meat Inspection. Role of Ascorbic Acid in the Preparation of High-Titre Serum].**—*Rev. Fac. Med. vet. S. Paulo.* **1.** 211–224. [English summary]. **1754**

M. found that the intravenous injection of ascorbic acid after immunization stimulated the production of a high-titre precipitin serum for the detection of the animal of origin of meat products. He found that the production of diphtheria antitoxin in horses was not satisfactory when the animals received ascorbic acid intravenously in relatively small doses.—M. WATSON.

MUDD, S., HEINMETS, F., & ANDERSON, T. F. (1943). **The Pneumococcal Capsular Swelling Reaction, Studied with the Aid of the Electron Microscope.**—*J. exp. Med.* **78.** 327–332. **1755**

The pneumococcal capsular polysaccharide, when prepared with meticulous precautions against alteration, has been found to be in the form of thread-shaped carbohydrate polymers.

It is concluded that the pneumococcal capsule is a gel of low density outside of, and closely applied to, the bacterial cell wall. [See also *V. B.* **14.** 153, abst. 986.] Interaction with homologous immune rabbit serum greatly increases the thickness and density of this capsular gel; the increase in thickness of the

specifically swollen pneumococcal capsule may exceed by 25fold the thickness of the surface deposit caused by rabbit immune serum on the cell walls and flagella of homologous non-capsulated bacteria.

Homologous immune serum permeates the pneumococcal capsular gel; the specific antibody combines with the capsular polysaccharide; nonspecific serum components are secondarily adsorbed to or combined with the specific antigen-antibody complex. The relatively low antibacterial titres characteristic of pneumococcal antisera can be explained in part by the permeation of the capsule by antiserum, in part by the high combining capacity of pneumococcal carbohydrate for antibody.—JOHN FRANCIS.

See also absts. **1679** (c.-f. test in Johne's disease), **1702** (immunity to *Cl. oedematiens*), **1722** (immunization against swine influenza), **1730-31** (immunization against rinderpest), **1733** (distemper virus vaccine).

PARASITES IN RELATION TO DISEASE [GENERAL]

*WILLEKE, H. (1938). Beitrag zum Parasitenbefall von Wildkaninchen und Hasen aus freier Wildbahn. **[Parasitism in Wild Rabbits and Hares in Game Preserves].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **85.** 372]. **1756**

The incidence of parasites in rabbits and hares in game preserves was found to be high. 75% of hares and 86% of rabbits were infected with intestinal coccidia, but *Eimeria stiedae* of the liver was not found. The chief cause of parasitic gastritis in rabbits was *Graphidium strigosum*, and almost 100% of healthy rabbits and 62·5% of hares were also infected. The chief cause of stomach worm disease in hares, *Trichostrongylus retortaeformis*, was present in 62%, chiefly light infestations, but was not found in healthy rabbits. No symptoms were noted with heavy infestations with *Passalurus ambiguus*, which was found in rabbits but not in hares. 39% of hares carried the tapeworm, *Cittotaenia pectinata*; generally single specimens were found in each animal, but more rarely two, and in one case 12, were found. *Cysticercus pisiformis* was present in 92% of rabbits and was the cause of heavy infestations of *Taenia pisiformis* in shooting dogs. The cysts were not found in the liver of the rabbit but under the visceral peritoneum of the rectum. A single specimen of *Fasciola hepatica* was found in a rabbit. One-third of the rabbits examined were infested with lice of the species *Haemodipsus ventricosus*, but only small numbers were present. Fleas and ticks were less frequent than lice.—T. E. GIBSON.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

FAIRCHILD, G. B. (1943). **An Annotated List of the Bloodsucking Insects, Ticks and Mites Known from Panama.**—*Amer. J. trop. Med.* **23.** 569–591. **1757**

This list is an attempt to collect together the available information on blood-sucking arthropods apart from mosquitoes, which are known to occur in the Republic of Panama. The list is primarily intended for medical entomologists and comprises Psychodidae, Ceratopogonidae, Simuliidae, Tabanidae, biting muscids, myiasis-producing flies, Hemiptera, Siphonaptera, Anoplura, Ixodoidea, and Acarina.—J. B. CRAGG.

KUKLA. (1943). Fliegenlarvenbefall beim Pferd. **[Infestation with Fly Larvae in Horses].**—*Z. Veterinärk.* **55.** 106–109. **1758**

K. refers to the considerable fly nuisance experienced both by men and animals on the Russian Front.

Observations made in the neighbourhood of Kursk during July and August, 1942, showed that of 300 horses examined, all were heavily infested with *Gastrophilus* larvae and the majority were also suffering from myiasis induced by *Wohlfartia magnifica*. This fly, in addition to infecting existing wounds, causes primary myiasis particularly in the genital and anal regions. Dermatol, Tannoform, and Rivanol had no effect on the larvae, and the best treatment is stated to be a daily dusting of the wounds with powdered burnt rubber which, in addition to clearing the wounds of larvae, is also claimed to prevent reinfestation.—J. B. CRAGG.

GRAHAM, L. T., & TATE, H. D. (1943). **Nebraska Cattle Grub Survey.**—*J. econ. Ent.* **36.** 801–802. **1759**

All cattle sent to the main packing plants in Omaha, Nebraska, were examined for warbles and the ownership of infested lots was then traced. 826 lots comprising 26,776 animals were examined. 85% of the animals were infested (*i.e.* at least one larva present), 61% having five or more larvae present. Of the 826 lots of cattle, no lot was free from infestation. Only 60 lots consisting of 1,843 cattle were obtained direct from Nebraska farms and of these 92% of the animals were infested, 64% having five or more larvae present.—J. B. CRAGG.

LAPYSHEV, D. A. (1940). K parazitologii podkozhnovo miaza v Sibiri. **[Parasitology of Creeping Eruption in Human Beings in Siberia].**—*Med. Parazitol., Moscow.* **9.** 392–400. [French summary]. **1760**

Six cases from Siberia, all caused by first-stage larvae of *Gastrophilus intestinalis*, are described in detail. In two cases infection was probably through the bites of horse flies.

L. discusses the method of infection in man, the incubation, and the speed of movement of larvae in human skin—controversial questions in the literature. A simple treatment is recommended.—A. MOLDAWSKY.

JACKSON, C. H. N. (1940). **The Analysis of a Tsetse-Fly Population.**—*Ann. Eugen., Camb.* **10.** 332–369. **1761**

Further studies of tsetse fly populations by marking tsetse flies and releasing them are recorded. As a result of the study of the migration rate of tsetse into and out of a 4-mile square, it is concluded that the flies live in confining ambits which are determined by the contact lines of vegetative types. The average distance travelled weekly in one direction by male flies is only about half a mile, but female tsetse appear to move more extensively.

By comparing the tsetse population of an area from which fire had been excluded for a year with the populations of control areas, it was found that in the fire-excluded area there was a fall in numbers during the dry season and early rains due to a fall in the emergence rate, but from then until the early dry season the numbers rose as the emergence rate became normal and life became abnormally prolonged.—U. F. RICHARDSON.

ROMANOV, A. N. (1940). Ekologiya sinantropnykh mukh yuzhnovo Tadzhikistana. **[Ecology of Synanthropous Flies in South Tadzhikistan].**—*Med. Parazitol., Moscow.* **9.** 355–363. **1762**

Items of interest include observations on flies which breed in dung in the hot, dry climate of South Tadzhikistan.—A. MOLDAWSKY.

SMITH, C. N., & COLE, M. M. (1943). **Studies of Parasites of the American Dog Tick.**—*J. econ. Ent.* **36.** 569–572. **1763**

An attempt is described to use the parasite *Ixodiphagus caucurtei* (*Hunterellus hookeri*) as a biological control of the American dog tick, *Dermacentor variabilis*. Information on the biology of the parasite and the methods used for breeding it are given. Some 90,000 female parasites were released in two localities on the island of Marthas Vineyard, Mass., during 1937–39. No parasites were recovered in ticks collected in the area during 1937–42, nor was there any decrease in tick numbers which could be attributed to the effects of parasitism.—J. B. CRAGG.

BURTT, E. T. (1943). **The Occurrence of the Tick Parasite *Ixodiphagus caucurtei* du Buysson (Hymenoptera; Chalcidoidea; Fam. Encyrtidae) in Great Britain.**—*Proc. R. ent. Soc. Lond.* Ser. A. **18.** 28–29. **1764**

Of 587 engorged nymphs of the sheep tick *Ixodes ricinus* collected on a Cumberland farm in September, 1942, two were infested with the parasite *Ixodiphagus caucurtei*. This is the first record of its occurrence in the British Isles; the geographically nearest records are from Northern France and it is widely distributed over the world. It is known to attack species from most of the genera of ixodid ticks.—J. B. CRAGG.

See also absts. **1665** (vectors of haemolytic streptococci), **1685** (transmission of tularaemia by tabanids), **1711** (vectors of piroplasmosis), **1712** (vectors of East Coast fever), **1842** (treatment of equine mange), **1843** (sweet flag as an insecticide).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

D'ALLAINES, F., LAVIER, G., & GANDRILLE. (1942). Une petite épidémie de distomatose hépatique à "Fasciola hepatica" diagnostiquée rétrospectivement. **[A Small Epidemic of *F. hepatica* Infestation in Man, Diagnosed Retrospectively].**—*Pr. méd.* **50.** 738–739. **1765**

Three cases of *F. hepatica* infestation of nine years' standing were diagnosed by the finding of adult flukes in one patient under operation for gall stones, and by the demonstration of *Fasciola* eggs in the faeces of all three persons. A feature of the cases was persistent eosinophilia.

The source of infection could not be definitely traced, but was probably watercress gathered wild or grown where it could be contaminated by sheep.—E. S.

—. (1943). Fra Innenriksdepartementet. Veterinaeravdelingen. Forordning om trikinose. **[Norway: Order Concerning Trichinosis].**—*Norsk VetTidsskr.* **55.** 508–510. **1766**

This is an amendment to previous legislation under the infectious diseases of animals law of 1894, whereby (1) it is forbidden to use meat from fur animals for human consumption or for food for animals unless it has been cooked for at least 2½ hours, and (2) fur animal owners are compelled to send tissue specimens from the carcass of every fur animal pelted to the district veterinarian for examination for trichinosis.

A further regulation lays down the legal process governing the removal or sale of fur animals from farms where trichinosis has been found to exist. This form of control is based on official serological tests of blood samples [no details]. Infected farms are released from this control if every animal examined at the annual pelting season is found to be free from trichinae.—J. E.

KAROKHIN, V. I. (1935). Krovoizliyanie i vospalenie v oblasti lokalizatsii Streptocara crassicauda var. charadrii Skrjab 1915 i Acuaria (Syncuaria) ciconiae Gilbert, 1927 "Anas sp." **[Local Lesion of the Stomach of Ducks Infested with *Streptocara crassicauda* var. *charadrii* and *Acuaria* (*Syncuaria*) *ciconiae*].**—*Trud. Ural'sk. vet.-zootekh. Inst.* No. 1. pp. 137–140. **1767**

The lesion consisted of a nut-sized haematoma beneath the gastric mucosa which bulged and contained several specimens of *S. crassicauda* var. *charadrii* and of *A. ciconiae*. Microscopically, there was proliferation of the tissues and cell infiltration containing eosinophiles.

K. states that *S. crassicauda* var. *charadrii* has not previously been described from ducks. He also points out that the illustration of this species on p.360, fig. 246 of YORKE & MAPLESTONE [(1926). "The Nematode Parasites of Vertebrates"], is faulty.—A. MOLDAWSKY.

See also absts. **1756** (helminths of wild rabbits and hares), **1867** (helminth parasites in goats), **1840-41** (treatment with phenothiazine).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

*MATTHIAS, D., & SCHÜTZLER, G. (1941). Der Lungenkrebs der Haustiere unter Berücksichtigung eines Falles beim Pferd. **[Lung Cancer in Domestic Animals, with one Case in a Horse].**—*Virchows Arch.* **308.** 243–252. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 26]. **1768**

Lung cancer is not uncommon in animals, though its development before the age of eight years is very rare, occurring only in the dog. An 18-year-old horse showing progressive wasting, was found to have an adenocarcinoma of the lung arising from the bronchial mucous membrane, with widespread metastases in the lymph nodes of the liver and spleen. Dust does not appear to play any part in the causation of lung cancer in the domestic animal.—ANN F. RUSSELL.

See also absts. **1829-1839** (treatment of carcinoma with H 11).

DISEASES, GENERAL

*JANSEN, J. (1941). **[Report on Diagnostic Work on Parasitic and Infectious Diseases at Utrecht University].**—*Tijdschr. Diergeneesk.* **68.** 784–791. [Abst. from abst. in *Wien tierärztl. Mschr.* **29.** 355]. **1769**

Of the 527 specimens examined, 300 were from poultry. In these coccidiosis, salpingitis, TB., and peritonitis were the most common findings. *Bacterium flexneri* was isolated from several monkeys with diarrhoea, and *Salmonella typhi-murium* from a g. pig showing purulent peritonitis and abscesses in the parenchymatous organs. *S. dublin* was found in the organs of a cow from a farm where there was an attack of acute diarrhoea, four cows having died.

—ANN F. RUSSELL.

OTTOSEN, H. E. (1943). Nogle differentialdiagnostiske Problemer vedrørende den patologisk-anatomiske Konstatering av Tuberkulose. 2. Meddelelse. **[Some Differential Diagnostic Problems Concerning the Pathological Diagnosis of TB. II].**—*Maanedsskr*

Dyrlaeger. **55.** 417–435. [See also *V. B.* **12.** 524]. **1770**

This, in direct continuation of the first communication consists of a number of case records of disease conditions in tissues sent to the Serum Laboratory at Copenhagen for the purpose of examination for suspected TB. The results of histopathological examination are described in detail.

This series includes cases of lymph-angioendothelioma of a cervical vertebra in a cow, pavement-celled carcinoma metastases of the peritoneum and pleura in another cow, adenocarcinoma metastases of the peritoneum and pleura also in a cow, adenocarcinoma metastases of the peritoneum and pleura in a 14-day-old calf, thoracic vertebral periosteal sarcoma in a colt with respiratory metastases, actinomycosis of the lungs of a calf, botriomycosis of the udder of a sow, and chronic interstitial pneumonia of a horse.

Finally, a rare case of peritoneal TB. in a cow without tuberculous lesions elsewhere, is described.

—J. E.

*Hülphers, G., & Henricson, T. (1943). Undersökningar på förekomst av infektionsämnen och trikiner hos råttor. **[The Examination of Rats for the Presence of Bacterial Infections and of Trichinae].** —*Svensk VetTidskr.* **48.** 245. [Abst. from abst. in *Norsk VetTidsskr.* **55.** 447]. **1771**

257 rats from various parts of Sweden were examined for *Erysipelothrix rhusiopathiae* infection which was found in 17 (6·6%), the organisms being identified on morphological, cultural, and serological grounds. 186 of these rats were also examined for other bacteria and *Salmonella typhi-murium* was found in 32, *S. enteritidis* in 14, *S. dublin* in 2, *Pasteurella tuberculosis* in 4, other pasteurella in 31, and tubercle bacilli in 1. *Brucella abortus* was not found at all. 476 rats were examined for trichinae with negative results.—J. E.

I. Cole, H. H., Mead, S. W., & Regan, W. M. (1943). **Production and Prevention of Bloat in Cattle on Alfalfa Pasture.**—*J. Anim. Sci.* **2.** 285–294. **1772**

II. Kleiber, M., Cole, H. H., & Mead, S. W. (1943). **Bloat in Cattle and Composition of Rumen Gases.**—*J. Dairy Sci.* **26.** 929–933. **1773**

I. The incidence of bloat in lactating and non-lactating cows on alfalfa pasture was reduced to a minimum by feeding Sudan grass hay at night. Alfalfa hay was also tried but was found to be less effective, and this is attributed to the finer consistency of this hay in comparison to Sudan grass hay. The authors reaffirm their theory that belching in cattle is a reflex stimulated by the presence of fibre in the rumen and that lack of sufficient fibre produces a condition in which gas cannot escape from the rumen as belching is not stimulated.

II. The concentration of hydrogen sulphide in the gases of the rumen of cows grazing on alfalfa pasture was within the same range, 0·08–0·15 volumes %, in both bloated and normal animals. Additional feeding with hay reduced the number of cases of bloat, an observation which supports the theory that bloat is due to lack of belching.—A. T. Phillipson.

Oppermann, T. (1943). Rätsel um den plötzlichen Herztod des Schweines ? **[Syncope in Pigs].**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 27–28. **1774**

An account of the previous findings by other workers upon this disease, and a suggestion that an inherited defect may be involved. Determinations of albumin : globulin ratios and cell counts of the blood in herds in which cases occur may give a clue to the aetiology.—J. G. Carr.

Holman, R. L. (1943). **Necrotizing Arteritis in Dogs Related to Diet and Renal Insufficiency. V. Evidence for a Dietary Factor.—VI. Associated Lesions: Stomatitis, Gastroenteritis and Pancreatic Fat Necrosis.**—*Amer. J. Path.* **19.** 977–991 & 993–1007. [For previous parts, see *V. B.* **13.** 400]. **1775**

V. Previous work by H. has shown that acute necrotizing arteritis, affecting chiefly the large elastic arteries, can be produced by controlling two factors, renal insufficiency and diet. The importance of renal damage has been confirmed by other workers but not the effect of diet. H. now gives full details of the "standard diet" used in the laboratory and presents evidence indicating that a dietary factor is concerned. With the same degree of renal damage, 22 of 25 dogs given the "standard diet" developed typical arterial lesions whereas only five of 97 dogs on a "regular kennel diet" (table scraps from University canteen, uncooked bones, and occasionally some proprietary dog food) were affected. If a dietary factor is involved it appears to be one which manifests itself only in the presence of renal insufficiency. The period for which the "standard diet" is fed before it induces renal insufficiency is important : it appears that at least eight weeks is necessary, but this period can be considerably reduced by repeated intravenous injections of citrated plasma from normal dogs.

VI. In a series of 57 dogs with experimental renal insufficiency (produced by uranium nitrate, mercuric chloride, or bilateral nephrectomy) the following lesions, in addition to the typical necrotizing arteritis, were found :– acute necrotizing stomatitis (42 dogs), acute haemorrhagic enteritis (28 dogs), and acute pancreatic fat necrosis (11 dogs). That these lesions are not due specifically to heavy metal damage is shown by the fact that all of them occurred after bilateral nephrectomy. Miscellaneous lesions observed in one or more dogs included subepicardial and subendocardial haemorrhages, acute mitral valvulitis, oedema of the tricuspid valve, haemorrhages in the thymus, and atrophy of lymphoid tissue.

[The occurrence of similar lesions in spontaneous renal damage in dogs due to various types of nephritis makes these observations of considerable interest to veterinarians. The detailed description of the changes and the illustrations afford an interesting comparison with the clinical picture of uraemia in the dog.]

—E. G. White.

Engel, F. L., Winton, M. G., Long, C. N. H. (1943). **Biochemical Studies on Shock. I. The Metabolism of Amino Acids and Carbohydrate during Hemorrhagic Shock in the Rat.**—*J. exp. Med.* **77.** 397–410. **1776**

Russell, J. A., Long, C. N. H., & Engel, F. L. (1944). **Biochemical Studies on Shock. II. The Rôle of the Peripheral Tissues in the Metabolism of Protein and Carbohydrate during Hemorrhagic Shock in the Rat.**—*Ibid.* **79.** 1–7. **1777**

Engel, F. L., Harrison, H. C., & Long, C. N. H. (1944). **Biochemical Studies on Shock. III. The Rôle of the Liver and the Hepatic Circulation in the Metabolic Changes during Hemorrhagic Shock in the Rat and the Cat.**—*Ibid.* 9–22. **1778**

Russell, J. A., Long, C. N. H., & Wilhelmi, A. E. (1944). **Biochemical Studies on Shock. IV. The Oxygen Consumption of Liver and Kidney Tissue from Rats in Haemorrhagic Shock.**—*Ibid.* 23–33. **1779**

I. Shock was induced in rats, under nembutal anaesthesia, by bleeding from the tail, either rapidly (during one hour) or slowly (during 2–5 hours). In order to gauge the role of adrenalin in causing the

symptoms of shock, measurements were also made upon intact, adrenalectomized and adreno-demedullated animals. In all three groups there was a rise in blood and plasma amino acids, which was inversely proportional to the survival time. In animals surviving the haemorrhage there was little or no elevation in whole blood amino acid level during the eight hours following haemorrhage, and a decrease in 24 hours which was due to haemodilution. The blood amino acids appeared to rise only after the blood pressure had fallen to 85–90 mm. mercury.

In all three groups the keto-acids and lactate of the blood were elevated during shock.

Hyperglycaemia was induced in normal rats when liver glycogen was sufficient (due to suitable feeding), but this effect was probably due to adrenalin secretion, since in the absence of the adrenal medulla no hyperglycaemia but a fall in blood sugar was seen in shocked animals. A smaller hyperglycaemia was observed in normal animals which had been insufficiently fed and the conclusion was drawn that in shock a hyperglycaemia due to glycogenolysis is balanced against an increased rate of utilization of sugar in the tissues.

The hypothesis is advanced that depletion of oxygen supply, primarily to the liver, but also to the peripheral tissues, is responsible for the above effects of shock.

II. In order to ascertain whether the blood changes produced by shock, as reported above, were due wholly or in part to depletion of oxygen supply to the peripheral tissues, measurements were made upon the blood of eviscerated (liverless) controls (1) and eviscerated shocked rats (2). The part played by the liver was then eliminated. Amino acid nitrogen accumulated more rapidly in (2) than in (1). Blood sugar fell more rapidly in (2) than (1), both when the animal was adreno-demedullated and when it was intact in this respect. Lactate and pyruvate increased in (2) but only slightly in (1); and while the lactate/pyruvate ratio did not alter in (1) until fatal convulsions set in, the ratio rose in (2).

The conclusion is drawn that amino nitrogen production in shock is in part due to increased protein catabolism in the peripheral tissues and that fall in blood sugar is similarly in part due to increased carbohydrate utilization in the peripheral tissues. The pyruvate and lactate changes, however, seem to be very largely due to an effect of shock and consequent anoxia upon the peripheral tissues rather than upon the liver.

III. To the fact that shock in rats was accompanied by a fall in blood pressure and rise in amino acids of the blood was added the observation that there was a corresponding fall in the oxygen saturation of the portal and peripheral venous blood. This observation was confirmed in cats. The functional activity of the hepatic artery did not affect the amino acid change due to shock. Rats whose livers were maintained upon their arterial blood supply alone, through elimination of the viscera and portal circulation were less well able to metabolize amino acids than normal animals or those which lacked the blood supply from the hepatic artery. Complete occlusion of the circulation to the rat liver caused after 45 min. irreversible damage to the organ's ability to metabolize amino acids.

An effect of anoxia of the liver in preventing the disposal of an extra accumulation of amino acids from the peripheral tissues in shock is indicated.

IV. Liver slices from shocked rats showed decreasing rate of oxygen uptake with severity of shock. Kidney slices were not similarly affected. A supplement of coenzyme factors (hot water extract of normal rat liver) only caused recovery of the slices in cases of mild shock. Succinate was equally well oxidized by liver of shocked and normal rats. Exposure of liver slices to nitrogen for 15–60 min. produced similar effects upon oxygen uptake to shock, but since kidney slices were in this case also affected a comparison could not well be drawn.—RACHEL MARSHALL.

EMERY, F. E., & MATTHEWS, C. S. (1943). **A Note on Cysts and Abscesses Induced in the Rat by the Injection of Oils.**—*J. Lab. clin. Med.* **28.** 1795–1798. [Authors' summary copied *verbatim*]. **1780**

Intramuscular injections of mazola, olive, cotton seed, sweet almond, sesame, and peanut oils were given in the hind leg of rats. A tissue capsule developed around the oil within a few days, forming an oil cyst which may remain in the muscles for at least a year. Abscesses developed in nearly half of the rats injected with sweet almond oil and in a few of those injected with cotton seed oil. Sesame oil formed a more durable cyst wall than mazola, olive, and peanut oils, but all four are less irritating than sweet almond and cotton seed oil.

MENKIN, V. (1943). **The Effect of the Leukocytosis-Promoting Factor on the Growth of Cells in the Bone Marrow.**—*Amer. J. Path.* **19.** 1021–1029. **1781**

This is a further contribution by M. to the study of leucocytosis-producing factors in inflammatory exudates. The factor was prepared from exudates obtained either from dogs (injection of turpentine into the pleural cavity) or from human patients (pleural or peritoneal cavity). Purification of the exudate by ammonium sulphate precipitation and dialysis yielded a pseudoglobulin which is claimed to be the leucocytosis-producing factor. Liberation of this factor at the site of inflammation is followed by its transport to the bone marrow where it causes the discharge of immature leucocytes, thus giving rise to leucocytosis. Injection of the pseudoglobulin into dogs also causes myeloid hyperplasia and an increase in megakaryocytes.

It is tentatively suggested that the injection of the leucocytosis-producing factor might be of value clinically by promoting myeloid hyperplasia and discharge of leucocytes into the circulation, *e.g.*, in infections in which the level of circulating leucocytes is important and in aplastic conditions of the marrow.—E. G. W.

RIDDLE, O., & HOLLANDER, W. F. (1943). **"Scraggly" Plumage and Ataxia. Two Inherited Characters in the Pigeon.**—*J. Hered.* **34.** 167–172. **1782**

Two mutational types appeared in 1914 and have been bred ever since. In one type the defective plumage prevents flight and is little able to conserve heat. A proportion of the feathers fails to penetrate the skin in the course of growth. In the other type the underdevelopment of neural areas and tracts in brain and cord prevents complete coordination of bodily movements. A paper on the physiological aspects is in preparation; the present one comprises an analysis of the inheritance of the traits, both of which behave normally as Mendelian recessives.—F. L. M. DAWSON.

See also abst. **1844** (treatment of colds in chickens).

NUTRITIONAL AND METABOLIC DISORDERS

YUDKIN, J. (1944). **Nutritional Deficiency in the Pathogenesis of Disease.**—*Brit. med. J.* Jan. 1st. pp. 5–7. **1783**

The criteria for assessing the role of nutritional deficiency in causing disease are laid down as follows:—(1) it should be possible to demonstrate the existence

of a deficiency of the nutrient; (2) deficiency of the nutrient should produce the disease; (3) the disease should be cured by replacement of the deficient nutrient.

The various ways in which evidence to satisfy these criteria may be collected are discussed. The fact that multiple deficiencies may be present is stressed, and also that variation in requirement, racial as well as individual, may occur.—E. M. CRUICKSHANK.

YUDKIN, J. (1943). **The Relative Efficacy of Calcium Carbonate and Calcium Phosphate in Preventing Rickets in Rats.**—*Biochem. J.* **37.** 543–546. **1784**

Rats were kept on diets mainly of flour, either white (70% extraction) or national wheatmeal (85% extraction) or a wheat-gluten mixture, to which were added varying amounts of $CaCO_3$ (Creta preparata) or $CaHPO_4$ up to a level of 3% Ca, *i.e.* 7·5% $CaCO_3$ or 10·1% $CaHPO_4$. After five weeks the rats were killed and the ash content of the femurs determined. In all cases $CaCO_3$ improved calcification when fed in the small amounts (0·065%) usually added to the national loaf, but larger amounts reduced the ash content. Phosphate, however, produced adequate calcification at either low or high levels. These differences were not associated with acceleration of growth, the gain on the white flour diet being less with added carbonate than with phosphate.—E. M. CRUICKSHANK.

GOSS, H. (1943). **Some Peculiarities of Ruminant Nutrition.**—*Nutr. Abst. Rev.* **12.** 531–538. **1785**

In addition to fermentation of cellulose and other complex polysaccharides the bacteria of the rumen are responsible for various synthetic processes. Ruminants do not appear to require the vitamin B complex in their food and this has led to the now substantiated hypothesis that the B complex is synthesized by the ruminant. Various intestinal bacteria, grown in a B-free medium, synthesize members of the B complex, while the ingesta of the rumen of sheep and cattle fed on a diet low in the B vitamins contains vitamin B_1, riboflavin, biotin, pantothenic acid, pyridoxine and nicotinic acid in amounts that are many times in excess of those present in the food. Vitamin C is not synthesized in the rumen, indeed, ascorbic acid, when added to ingesta of the rumen is rapidly destroyed. Vitamins A and D seem to be required in amounts that are comparable to those required by other species, and there is no evidence that vitamin E is synthesized in the rumen. Vitamin K is present in the ingesta of the rumen in greater quantity than in the diet.

The use by the organisms of the rumen of non-protein nitrogen as a source of nitrogen, has been exploited to reduce the quantity of true protein in the ration. Urea or ammonium salts can be converted to protein in the rumen under suitable conditions and the bacterial protein so formed is apparently digested in the intestines, for urea and ammonium salts have been shown to be capable of replacing part of the protein of the ration for maintenance, growth, and milk production.—A. T. PHILLIPSON.

FAIRBANKS, B. W., & KRIDER, J. L. (1944). **Factors Involved in the Synthesis of Vitamins in the Ruminant.**—*N. Amer. Vet.* **25.** 97–100. **1786**

A continuation of an earlier article. Various dietary factors, including physical balance, pH, sulphur and nitrogen-contents, are discussed in relation to vitamin synthesis, and ruminal temperature is mentioned. There is a useful list of references.—A. N. W.

BENHAM, G. H. (1943). **Vitamin A and New-Born Pigs.**—*Canad. J. comp. Med.* **7.** 291–297. **1787**

The method is described for determining the vitamin A content in colostrum of sows, and in livers of newly born and of young pigs varying from 2–46 days old. Excluding the colostrum of one sow, treated with 400,000 I.U. of vitamin A during ten days prior to farrowing, which gave a very high reading, the vitamin content per 100 ml. of colostrum collected one day after farrowing from each of five sows, varied from 131–254 I.U. Figures presented indicated that there were likewise wide variations in the vitamin A content of livers of pigs from different litters and even among those from the same litter.—L. M. HEATH.

TIMIN, K. S., & PERETURINA, M. F. (1941). Vliyanie zarodysheĭ zerna pshenitsy na spermoproduktsiyu bykov-proizvoditeleĭ. **[The Influence of Wheat Germ on Sperm Production by Bulls].**—*Dokl. vsesoyuz. Akad. sel'skokhoz. Nauk.* No. 6. pp. 17–21. **1788**

Feeding experiments for 12 and 48 days were performed in two groups, each consisting of five pure-bred Shorthorn and Angus-Aberdeen bulls, which were used intensively for artificial insemination. The group of bulls whose diet was supplemented with 20% of wheat germ concentrate showed a 32% increase of sperm concentration, a 31·5% increase of spermatozoa in ejaculates, and 63·6% increase of sperm viability. The tests were made every three days, in accordance with methods adopted by the All-Union Institute for Animal Husbandry. The sperm motility and libido of the bulls were also improved. The beneficial effects of wheat germ administration appeared 25–30 days after the beginning of feeding; the authors consider this to be due to slow spermatogenesis in bulls.

The addition of 800–1,000 g. of wheat germ in the daily ration of breeding bulls is recommended.
—A. MOLDAWSKY.

WINTROBE, M. M., FOLLIS, R. H., Jr., ALCAYAGA, R., PAULSON, M., & HUMPHREYS, S. (1943). **Pantothenic Acid Deficiency in Swine. With Particular Reference to the Effects on Growth and on the Alimentary Tract.**—*Johns Hopk. Hosp. Bull.* **73.** 313–341. **1789**

A description is given of the symptoms and lesions, other than those of the nervous system, produced in pigs by the method already described [see WINTROBE *et al.*—*V. B.* **13.** 297].

Deficiency symptoms commenced as early as 11 days after the beginning of the experiment, comprising diarrhoea, loss of appetite, cessation of weight-increase, roughness of the coat, and general unthriftiness. Later a patchy alopecia developed. The faeces were often bright yellow in colour, watery, and contained mucus. The results of rectosigmoidoscopic examinations are given. Gastric analyses did not indicate any marked abnormality. In 13 out of 18 pigs there was a moderate, normocytic anaemia, while in several cases the volume of packed red cells dropped from the normal of 41·5–51·5 to between 35 and 40 ml. per 100 ml. blood. There was a consistent fall in plasma chloride, in some cases a rise in the CO_2-combining power of the blood, but no hypoglycaemia such as has been noted in pantothenic acid-deficient dogs.

Pathologically, the deficiency was found to be the most striking yet produced among the B vitamin studies now being conducted with pigs. The most pronounced macroscopic changes were found in the gastro-intestinal tract. There was an extensive colitis, and in some cases ulcers were present. Histologically, atrophy of the cells lining the mucosal glands and abscess formation were observed.

Marked clinical improvement, restoration of weight-gain, regression of the anaemia and of other blood changes, and steady improvement in the bowel (as seen with a rectosigmoidoscope) occurred in animals dosed

with 500 μg. calcium pantothenate per kg. body weight daily, and this amount likewise prevented the appearance of deficiency systems in control animals. In prophylactic doses, 60 μg. per kg. body weight daily was ineffective, while 80 or 160 μg. daily afforded partial protection.

In the course of the discussion, it is noted that whereas diarrhoea has invariably occurred in the authors' pantothenic acid-deficient pigs, it has not occurred in their nicotinic acid-deficient pigs. This is in contrast to the findings of CHICK *et al.* [see *V. B.* **9.** 269.] and of other workers.—ALASTAIR N. WORDEN.

MANNERING, G. J., CANNON, M. D., BARKI, H. V., ELVEHJEM, C. A., & HART, E. B. (1943). **Further Evidence for the Existence of Specific Dietary Essentials for the Guinea Pig.**—*J. biol. Chem.* **151.** 101–107. **1790**

In addition to the factors present in linseed meal, a factor found in solubilized liver powder and grass-juice powder was found to be necessary for the g. pig. The distribution and properties of this factor are discussed. —E. M. CRUICKSHANK.

See also abstr. **1775** (diet in relation to necrotizing arteritis), **1791** (lipotropic factors), **1806** (endocrine control of Ca metabolism).

PHYSIOLOGY AND ANATOMY

MCHENRY, E. W., & PATTERSON, J. M. (1944). **Lipotropic Factors.**—*Physiol. Rev.* **24.** 128–167. **1791**

A lipotropic factor is defined for the purposes of this review as "a substance which prevents or removes an accumulation of excess fat in the liver," and the following are considered under separate headings :– (1) choline, betaine and related compounds, and choline precursors such as methionine ; (2) lipocaic ; and (3) inositol.

Under (1) many recent papers are dealt with, detailed consideration being given to :– the action of choline in various types of fatty liver ; the relation of B vitamins to the production of fatty livers and to the action of choline ; the lipotropic action of amino-acids and proteins ; the distribution, biological synthesis, and possible mode of action of choline ; the relationship of choline deficiency to renal damage, perosis, hyperplasia of the murine forestomach ; certain types of hepatic tumour ; and the formation of acetylcholine. The classification of choline as a vitamin, and especially as a member of the vitamin B_4 complex, is deprecated.

Under (2) support is given to the findings of DRAGSTEDT and his colleagues, but the material reviewed in this and in part (3) has already been noted elsewhere in the *Vet. Bull.* It is suggested that inositol, like choline, owes its lipotropic activity to participation in the formation of certain phospholipids. There is a useful table comparing the effects of the different lipotropic factors, although unfortunately the particular references are not cited in it, and must be searched for in the general text.—ALASTAIR N. WORDEN.

ARCHIBALD, L. G., & LINDQUIST, H. G. (1943). **Manganese in Cows' Milk.**—*J. Dairy Sci.* **26.** 325–330. **1792**

The manganese content of the milk was markedly increased (about doubled) when 1 oz. daily of anhydrous manganous sulphate was fed to cows. A further, but not proportional, increase was obtained when the amount fed was increased to 2 oz. daily. No effect of the metabolized manganese was observed in regard to the development of oxidized flavour either in ordinary milk or in milk to which copper had been added to accentuate the defect.—R. ALLCROFT.

FELL, H. B., & DANIELLI, J. F. (1943). **The Enzymes of Healing Wounds. I. The Distribution of Alkaline Phosphomonoesterase in Experimental Wounds and Burns in the Rat.**—*Brit. J. exp. Path.* **24.** 196–203. **1793**

Standard experimental wounds and burns were made in the dorsal skin of rats under ether anaesthesia, by excising a circle of skin of 6 mm. diameter or burning with a soldering iron 1·5 mm. in diameter for about 1 sec. The animals were killed from 1–19 days after operation and sections made of the wound or burn area, or pieces of the skin affected were dried and used for chemical estimations of phosphatase activity. The sections were incubated in sodium glycero-phosphate for 24 hours and then stained to convert calcium phosphate, which had been precipitated in the regions of phosphatase activity, to cobalt phosphate and this to black cobalt sulphide, according to the technique of Gömöri. Phosphatase was estimated chemically by measurement of liberated inorganic phosphate. Both histological and chemical methods revealed that during the early stages of repair phosphatase was detectable only in the invading polymorph leucocytes which were particularly concentrated in the scab. Regenerating connective tissue, however, stained strongly in the later stages and when the formation of collagen fibres began the phosphatase reaction was intense (5th or 6th day). The phosphatase content began to decline about the 11th or 12th day and had returned to normal at the 17th to 19th day. The possibility that phosphatase, though present, is inactive in normal skin was rejected since incubation with known activators and inactivators of alkaline phosphatase failed to alter the results obtained by histological and chemical means. The authors believe that phosphatase plays a part in the laying down of collagen in healing wounds.

—RACHEL MARSHALL.

SOPEÑA, I. (1943). I. Determinación de la glucemia en vacas lecheras en relación con la producción láctea. II. La glucemia normal del cerdo. **[I. Influence of Lactation on the Blood Sugar Level of Dairy Cattle. II. Normal Blood Sugar Level of the Pig].**—*Rev. Fac. Agron. B. Aires.* **10.** 263–272. [English and Portuguese summaries]. **1794**

From determinations on 17 cows, S. was unable to find any correlation between the blood sugar content and the amount of milk secreted. The average value for the blood sugar was 0·66 parts per thousand (range 0·40–0·92). Determinations on three male and three female pigs gave an average blood sugar content of 1·019 parts per thousand.—J. G. CARR.

RHIEL, J. (1943). Vergleichende Blutuntersuchungen. Viscositäts-und refraktometrische Bestimmungen des Blutes, Plasmas und Serums von Pferden, Rindern, Schweinen, Schafen, Ziegen und Kaninchen nebst Hämoglobinbestimmungen. **[Comparative Blood Studies. Viscosity and Refractometric Determinations of the Blood, Plasma, and Serum of Horses, Cattle, Pigs, Sheep, Goats, and Rabbits, Together with Haemoglobin Determinations].**—*Pflüg. Arch. ges. Physiol.* **246.** 709–727. **1795**

The law of haemoglobin distribution has been determined from the results obtained by previous workers for the erythrocyte count (E), the haemoglobin content (Hb), the erythrocyte content (Hb_E), the leucocyte count, and the refractive index (n_D). In human beings and other mammals, the erythrocytes are found to have the same haemoglobin content per unit area, *viz*, $31–32 \times 10^{-14}$ g.

R. extended this investigation by a study of the viscosity of whole blood, plasma and serum (η_B, η_P, and η_S), and has applied these to the ratio of albumen content : refractive index of plasma and serum, with a view to detecting changes caused by fibrinogen.

It was first necessary to determine the absolute Hb content of the blood, in order to calculate the Hb_E and the E-count for each animal. Results reported by previous workers are given. Five males and five females of each of the following species were used :– horses, cattle, pigs, sheep, goats, and rabbits.

Details of the methods used for blood sampling, spectrophotometric determination of Hb, determination of viscosities, and of the refractive index of plasma ($n_{D(P)}$), are described. The refractive index-albumen content ratio of serum is also discussed.

The mean results obtained were :–

	Hb (g)	η_B	η_S	η_P	$n_{D(P)}$	% Albumen (plasma)	$n_{D(S)}$	% Albumen (serum)
Pigs	15·95	5·95	1·84	2·11	1·3502	8·6	1·3497	8·0
Rabbits	11·85	3·45	1·55	1·65	1·3478	6·85	1·3475	6·7
Cattle	11·75	4·62	1·76	2·02	1·3488	7·47	1·3483	7·15
Horses	11·78	4·13	1·80	2·05	1·3489	7·54	1·3484	7·25
Sheep	11·81	4·27	1·71	1·93	1·3487	7·37	1·3482	7·13
Goats	10·87	3·96	1·73	1·99	1·3492	7·66	1·3486	7·34

The values for Hb are in good agreement with those obtained by earlier workers.

A definite relation is found to exist between the Hb value and the blood viscosity, but this does not hold at high Hb contents. Omnivorous pigs have a higher Hb content than the herbivorous animals. In other respects the figures show little difference from one species to another, and sex has little effect (some animals were castrated). The plasma and serum viscosities are very close together in all cases, and a constant ratio was found in each species between albumen content and viscosity. The specific viscosity can be calculated by dividing the difference between total and residual viscosities by the albumen content in each case.—M. H.

DAVIS, J. E. (1943). **Erythrocyte Longevity in Dogs and Rabbits.**—*J. Lab. clin. Med.* **28.** 848–850. **1796**

Polycythemia was produced in dogs and rabbits by daily exercise, continued administration of cobalt chloride, exposure to low atmospheric pressure, or daily ephedrine administration. Reduction of the polycythemia by liver or vasodilator drugs was presumed to act by checking erythropoiesis. Thus the time required for return of the erythrocyte count to normal was a measure of the life-span of an erythrocyte. This life-span was calculated to be 20 days in the dog and 22 days in the rabbit.—RACHEL MARSHALL.

KOROPOV, V. M. (1935). K voprosu o soderzhanii ostatochnovo azota (RN) v krovi zdorovykh loshadeĭ. **[Residual Nitrogen in Normal Horse Blood].**—*Trud. Ural'sk. vet.-zootekh. Inst.* No. 1. pp. 196–198. **1797**

Examinations made on normal cavalry horses of a local Siberian breed showed that the average residual nitrogen [? non-protein N] content of the blood was 32·5 mg. %.

K. indicates the value of the determination of blood residual nitrogen (where there are facilities for the test) for diagnosis and prognosis of diseases of the kidney. —A. MOLDAWSKY.

BAKER, F. (1943). **Direct Microscopical Observations upon the Rumen Population of the Ox. 1. Qualitative Characteristics of the Rumen Population.**—*Ann. appl. Biol.* **30.** 230–239. **1798**

The organisms of the rumen can be divided into three major groups, namely the protozoa, the iodophilic organisms, and the aniodophilic organisms. The iodophilic organisms owe their name to the fact that they stain blue with iodine, which is indicative of the formation of a polysaccharide within their cytoplasm. The iodophilic organisms are held to be responsible for the breakdown of cellulose and starch in the rumen and the polysaccharide to be formed from the products so liberated.

The protozoa and the iodophilic organisms disappear from the ingesta as they pass through the alimentary tract. This is due, in the case of the protozoa to peptic and tryptic digestion, and in the case of the iodophilic organisms to ingestion by protozoa, autolysis, and to the action of the digestive juices.—A. T. P.

WILLETT, E. L., & SALISBURY, G. W. (1942). **The Effect of Various Diluters, Cooling Rate, Temperature of Storage, and Some Other Factors, on the Livability of Spermatozoa in Stored Samples of Bull Semen.**—*Mem. Cornell agric. Exp. Sta.* No. 249. pp. 45. **1799**

As a result of the detailed and controlled experiments reported in this bulletin, the authors formulate certain recommendations for the handling of bull semen for field use in the artificial breeding of dairy cows. They confirm that chilling of the semen at, or after, collection is detrimental to the viability of spermatozoa.

Of the different diluents studied, egg-yolk phosphate [PHILLIPS & LARDY (1940)] and egg-yolk citrate [SALISBURY *et al.* (1941)] maintained greater sperm motility during storage than did either SGC–2 (13·6 g. Na_3SO_4, 12 g. anhydrous glucose, 5 g. Witte's peptone, and one litre distilled water) or undiluted semen. The spermatozoa were also more highly motile in undiluted semen than in SGC–2. A comparison of the yolk phosphate and the yolk citrate diluents showed the latter to preserve motility at a higher level after eight and ten days' storage than did the former. Field studies of these diluents indicated that they were comparable up to five days of storage for maintaining the fertilizing ability of spermatozoa. With care, semen stored in either of these diluents can be used for four days with results equal to those obtained from use of the same diluted semen on the day of collection. For routine field use, the authors prefer yolk citrate because it is easier to prepare, and because it disperses the fat globules and other materials in the egg yolk and thus enables the individual spermatozoa to be seen under the microscope.

The present investigation concerning the optimum conditions for storage confirm that temperature is extremely important. The optimum temperature for long storage was found to be between 1° and 5°C. These studies also showed that for optimum livability of the spermatozoa at the lower temperatures, the rate of cooling must be slower than is necessary for storage at higher temperatures. For storage at 1°C., the optimum rate of cooling was found to be 5 degrees per two hours, and for storage at 5°C., 5 degrees per 20 min. The optimum storage temperature under practically field conditions is thought by the authors to be 5°C., since the time factor involved in cooling to lower temperatures is too long for routine purposes.

In several experiments it was consistently found that greater sperm motility was maintained when the semen to be stored was covered with a layer of mineral oil than when the oil was not used. The pH measurements made in these investigations showed a greater decrease in pH during storage of the samples under oil.

Evidence was obtained that the rate of warming semen from the storage temperature to body temperature should be rapid. Even the most rapid rate of warming employed in these studies, 30 degrees per min., was not harmful. Results from these experiments would indicate that spermatozoa probably are not injured when semen is removed from storage and immediately

inseminated into the cow, as is the usual practice in artificial breeding.

The studies carried out on the effect of initial pH level on sperm motility during storage indicated that the range recommended by PHILLIPS & LARDY (1940) was too narrow. Equal results were obtained when the semen-yolk-phosphate mixture was adjusted to a pH level of 6·5, 6·75, or 7·0 before storage. Since the pH of the semen yolk-phosphate or citrate mixture seldom, if ever, varies beyond these limits when normal semen is used and the buffers are made up according to directions, the field worker need not bother to adjust the semen-diluent mixture to a fixed pH.

Buffer-coefficient and neutralization curves are presented for the semen of the bull, stallion, dog, and man, and after comparison of these with buffer-coefficient curves of solutions of citrates, phosphates, and carbonates, the authors believe the normal buffer capacity of semen to be due primarily to these substances.—N. J. S.

*FESTER, A. (1941). Die Prüfung der Jungbullen auf Zuchtverwendungsfähigkeit vor der Körung und Versteigerung. **[Testing of Breeding Capacity of Young Bulls before Selection and Auction].**—*Inaug. Diss., Hanover.* Abst. from abst. in *Schweiz. Arch. Tierheilk.* **85.** 345]. **1800**

Constantly recurring controversies between vendor and purchaser of young breeding bulls have led to the demand that they should be tested for copulating and fertilizing ability before they can be entered for public sale. F. has performed a large number of such tests and he describes them in detail. Forty-one out of 70 young bulls (59%) accepted the artificial vagina, using a cow at or near oestrus. Another 23 bulls (33%) served cows ready for bulling. Four bulls refused the artificial vagina but executed natural service correctly. Four of the 70 tested animals (6%) turned out to be wholly or partially unfit for breeding. Of these, two could not copulate and two were sterile. F. considers that this indicates the necessity for testing young bulls as to their suitability for breeding purposes prior to their being graded for public auction.—D. N. SPRIGGS.

BOYD, J. D., HAMILTON, W. J., & HAMMOND, J., Jr. (1944). **Transuterine (' Internal ') Migration of the Ovum in Sheep and Other Mammals.**—*J. Anat.* **78.** 5–14. **1801**

A review of the literature shows that transuterine migration of the ovum, *i.e.* its passage from one uterine horn to the other, is of widespread occurrence in Eutheria. The observations recorded here reveal that in double pregnancies in sheep, with two corpora lutea in one ovary, it was common to find one embryo in each horn. In cases with a single corpus luteum, however, in only one case examined was the embryo not in the corresponding horn. This would suggest that migration is associated with the even distribution of embryos in the uterine cavity; but, as is pointed out by the authors, this explanation does not hold for all species, as migration is common in the mare, which normally is monovular.

The mode of migration is discussed. It is suggested, as there is no motility in the ovum itself, that the rhythmic contractions of the uterine muscle may be among the main factors involved.—C. W. OTTAWAY.

PAYNE, F. (1943). **The Cytology of the Anterior Pituitary of Broody Fowls.**—*Anat. Rec.* **86.** 1–13. **1802**

The cytology of the hypophysis was studied in 21 broody hens, the stage of broodiness varying from a few days to periods of 1–7 weeks after chicks had been hatched. The most striking feature was the development of an area of characteristic small cells with large, clear vesicular nuclei—termed by P. " broody cells "—which appeared to arise by transformation of the normal acidophile, basophile, and chromophobe cells. The area extended until, at its fullest stage of development (2–3 weeks' incubation in White Leghorns), it involved the greater part of the hypophysis. The cytological features had returned to normal when the chicks were 7–8 weeks old and by this time the ovary had enlarged and the comb had become more turgid.

P. suggests that the " broody cells " may be homologous to the " pregnancy cells " found in the hypophysis of pregnant mammals.—E. G. WHITE.

MARTIN, G. J. (1943). **Study of Various Chemicals Depressing the Thyroid Gland.**—*Arch. Biochem.* **3.** 61–69. **1803**

Using rats, mice, g. pigs, and dogs as experimental animals, M. demonstrated that certain chemicals such as *p*-aminobenzoic acid, sulphonamides, and thiourea are capable of causing three general types of reaction which have formerly been regarded as independent, *viz*, (1), production of thyroid hypertrophy with hypothyroidism, (2) protection against the toxic action of injected thyroxine, and (3) the pseudopotentiation of insulin in starved mice. Forty-five compounds were tested for one or more of these activities and it is predicted that each compound effective in one system will be effective in each of the others. A consideration of the properties which characterize molecules of the active type show that it is not a specific mechanism but a general one associated with a wide variety of organic molecules and it is suggested that the reactions are due to a generalized inhibition of tissue metabolism.—R. A.

FILLI, O. (1943). Studien über die ökologischen Zusammenhänge der Schilddrüsenstruktur, nach Untersuchungen an Haustieren im Münstertal (Val Müstair). **[Studies on the Ecological Relationships of Thyroid Structure, from Observations on Domestic Animals in Munstertal, Switzerland].**—*Schweiz. Arch. Tierheilk.* **85.** 181–193, 250–259 & 294–306. **1804**

This is an application of the researches of DUERST [*V. B.* **14.** 184.]; the findings can be summarized thus :– the reduced O_2 available at high altitudes tends to produce thyroid hyperplasia; if excess of Ca is taken in the food and water, this will result in the hyperplastic type of thyroid associated with non-toxic goitre, while excess of K or acidosis will tend to produce the Grave's disease or toxic goitre syndromes associated with parenchymatous alterations of the thyroid.

F. discusses the geology of the district and some analyses of the water supplies, and concludes that a slight lack of Ca is aggravated by an excessive amount of SO_4 in the water, which not only renders this Ca unavailable to the organism, but causes further depletion of the Ca in the body, and also acidosis. The intensity of the parenchymatous alterations of about 85% of cattle and pig thyroids can, on this theory, be related to the conditions obtaining where the animal is kept. This parenchymatous alteration is aggravated by the I_2 in the salt, and it is suggested that in these regions, non-iodized salt should be available, so that the thyroid alterations would then tend to the non-toxic type.

—J. G. CARR.

MEDYAKOV, F. (1935). Opyt izucheniya vliyaniya testolizata na uslovnoreflektornuyu deyatel'nost' sobaki. **[Influence of Testolysate on Conditional Reflexes in Dogs].**—*Trud. Ural'sk. vet.-zootekh. Inst.* No. 1. pp. 117–124. **1805**

This deals with the influence of testicular hormones in a dog conditioned according to Pavlov's technique. It was found that the conditioned salivation reflex sub-

sided more slowly and reappeared more quickly after administration of the testolysate.—A. MOLDAWSKY.

CAMPBELL, I. L., & TURNER, C. W. (1942). **The Relation of the Endocrine System to the Regulation of Calcium Metabolism.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 352. pp. 134. **1806**

A study of the relation of the endocrine system to the regulation of Ca metabolism was mainly concerned with the function of the parathyroid gland since much evidence is available to show that it is active in this respect.

Increased demand upon the parathyroid as indicated by increased size and weight of the gland was shown during periods of excessive demand for Ca, *e.g.* lactation, and removal of one gland, caused hypertrophy of the other in rabbits and, after a time, in rats.

Extirpation of the parathyroid glands or hypoparathyroidism caused an alteration of various aspects of Ca metabolism; thus low blood Ca, reduced excretion of Ca, retention of P as high blood inorganic phosphate, and increased excretion of Ca into the intestine were observed. The reaction to parathyroidectomy varied in different species, thus sheep and goats were little susceptible and even when the blood Ca was considerably reduced and the Ca of the diet low, symptoms were not acute. Young growing and late pregnant and lactating animals were more susceptible. Ca relieved the symptoms of parathyroidectomy, both the absolute amounts and the Ca : P ratio being important factors.

The effect of administration of parathyroid extract (by injection since its protein nature rendered it digestible if given by the mouth) to normal and parathyroidectomized animals, was to cause a rise in blood and urine Ca and of P in the urine and some decrease in blood inorganic P. The effects upon phosphatase were contradictory. Variations in diet, as regards factors affecting Ca metabolism, did not greatly affect the reaction towards parathyroid extract administration. The hormone appeared to act in the absence of adrenal, pituitary, and thyroid glands. Its mode of action is unknown. Various methods of assay of the parathyroid hormone have been attempted. The most satisfactory was that depending on the counteraction of the effect of sodium citrate in causing convulsions in the rat or chick.

The possibility that the parathyroid is rendered active by a secretion of the pituitary was rejected, since evidence for effects upon parathyroid tissue and blood Ca of hypophysectomy, of injection of pituitary extract, and of implantation of pituitary tissue was contradictory.

Diets low in Ca and vitamin D and, to a lesser extent, high in P content led to enlargement of the parathyroids. The addition of vitamin D to a diet low in Ca resulted in a diminution of the parathyroid enlargement.

Oestrogens have been shown to cause a rise in blood Ca and ossification of bone in birds, but the effects were less marked or negative in mammals. That this effect was independent of possible intermediary parathyroid activity was indicated by the fact that the oestrogens produced effects upon calcification without causing enlargement of the parathyroids and produced equal effects upon ossification of long bones in normal and in parathyroidectomized animals.

The conclusion is drawn that the activity of the parathyroid gland is called into play during periods of acute Ca demand such as late pregnancy and lactation while normally its activity is not drawn upon. When vitamin D is adequate in the diet the necessity for parathyroid activity may be reduced.—R. MARSHALL.

GUTMANN, E., & YOUNG, J. Z. (1944). **The Re-Innervation of Muscle after Various Periods of Atrophy.**—*J. Anat.* **78.** 15–43. **1807**

Experiments were conducted on the nerves supplying the peroneal muscles of the rabbit to determine the extent to which normal innervation can be regenerated after injury and whether the speed of recovery is related to the period of muscle atrophy. The re-innervation of muscle is established with the entry of functional nerve fibres into a motor end plate. With prolonged periods of atrophy, several tissue changes occur which influence the effectiveness of this contact. The various methods by which nervous control is re-established under such circumstances are discussed.—C. W. O.

ADRIAN, E. D. (1943). **Sensory Areas of the Brain.**—*Lancet.* **245.** 33–35. **1808**

By means of electrical technique it is possible to map out cortical areas which act as receiving centres for incoming messages from the sensory organs. These areas vary according to body structure and habit and it has been found that in the majority of animals the touch receptors in the region of the lips and nostril have the most abundant connexion with the cortex.—C. W. O.

GLEES, P. (1944). **The Anatomical Basis of Cortico-Striate Connexions.**—*J. Anat.* **78.** 47–51. **1809**

As a result of experiments carried out on the brain of the cat and rabbit, G. has demonstrated that the suppression areas of the cerebral cortex are connected to the caudate nucleus by direct non-myelinated fibres or at least by fibres which lose their myelin sheath on entering the nucleus. These fibres enter into the formation of the pericellular plexus of the caudate nucleus. The question of cortico-striate connexions is discussed. —C. W. OTTAWAY.

VAN DE PAS, L. (1942). El agujero oval interatrial. Observaciones sobre su naturaleza y su oclusión. [**The Foramen Ovale**].—*Rev. Fac. Agron. vet., B. Aires.* **10.** 17–23. [English and Portuguese summaries]. **1810**

The author considers that the structure of the foramen ovale and its valve, in the bovine and equine foetus, is not of developmental origin, but results from weakness and perforation of the interatrial wall. [This deduction does not appear to be supported by the evidence.]—ISOBEL W. BROCKLEHURST.

See also abst. **1855** (a test for pregnancy gonadotropins).

POISONS AND POISONING

MARSHALL, D. (1942). **Poisonings of Livestock.**—*N.Z. J. Agric.* **64.** 11–13 & 99–102. **1811**

Some of the more common causes of poisoning of stock and the conditions under which they occur are briefly discussed. The inorganic poisons considered include arsenic, lead, zinc and sodium chloride; the plants dealt with are ragwort, tutu [*Coriaria ruscifolia*], hemlock, ngaio [*Myoporum laetum*], buttercup, nightshade, privet, and mangolds.—M. B. BUDDLE.

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

MEIER, R. (1943). Die Methodik der pharmakologischen Bewertung des Sulfanilamids und seiner Derivate. **[Technique of Pharmacological Evaluation of Sulphonamides].**—*Schweiz. med. Wschr.* No. 19/20. pp. 560–563. [French and Italian summaries]. **1812**

A general discussion of the methods used for evaluation.—JOHN FRANCIS.

STAEHELIN, R. (1943). Grundsätzliches zur Bewertung des Erfolges von Arzneimitteln. **[Basis of Evaluation of Results of Chemotherapy].**—*Schweiz. med. Wschr.* No. 19/20. pp. 549–552. [French and Italian summaries]. **1813**

The value of a drug can be assessed by clinical observation or by a statistical analysis of the results of treatment. S. considers that the latter may be the method chosen by the scientist, but with a good observer clinical observation is often superior.

A statistical study of death rates from pneumonia before and after 1939 indicates that sulphonamide therapy has reduced the mortality from 23% to 13·5%. —JOHN FRANCIS.

STAUB, H. (1943). Ueber den Mechanismus der Chermotherapeutika. **[Mechanism of Chemotherapy].** —*Schweiz. med. Wschr.* No. 19/20. pp. 552–558. [French and Italian summaries]. **1814**

R. W. BUNSEN, 1837, made the fundamental observation that although a given weight of arsenic as cacodyl oxide was harmless when given intravenously, the same weight of arsenic as arsenious oxide was toxic. It was not, however, until late in the nineteenth century that EHRLICH developed chemotherapy. He examined numerous organic arsenical preparations comparing the toxic with the curative dose ; salvarsan was thus evolved, using fowl spirochaetosis for experimental trial. Erlich postulated that the bacterial protoplasm must have a special affinity for any effective drug.

After this introduction, the modern development of chemotherapy is then traced. The work on *p*-aminobenzoic acid, methionine and pantothenic acid in relation to sulphonamide therapy, and the action of guanidine, amidine, and the diamidines on trypanosomes and the relationship of this action to that of the quaternary ammonium compounds such as zephirol are reviewed.

The lactic acid bacilli require vitamin B_6 (pyridoxine) for growth, boric acid forms a complex with this vitamin rendering it non-available and thus inhibiting growth. The earlier work on penicillin and some other biological antagonists is mentioned.

There is a general discussion on the theory of chemotherapeutic action. S. concludes that it is on a detailed study of pharmacology and particularly on intracellular reactions that further advance will depend and he advocates the use of tissue culture.—J. F.

KOHN, H. I. (1943). **The Sulfonamides : A General Discussion of the Principles Underlying their Use.**—*Cornell Vet.* **33.** 333–338. **1815**

A review of well known work. In general, the therapeutic blood levels in man are :– sulphanilamide, 10–15 mg. per 100 ml. (mg. %) ; sulphathiazole and sulphadiazine 5–10 mg. %. The average initial dose is about 4 g. followed by 1–1·5 g. every 4–6 hours. Since sulphanilamide and sulphathiazole are absorbed and excreted by the kidney more readily than sulphadiazine, their dosage is greater than that of the latter. Sodium sulphathiazole is excreted so readily that it is very inefficient given intravenously.—JOHN FRANCIS.

HARTMANN, M., & DRUEY, J. (1943). Modellversuche zur Frage der Adsorption von Sulfanilamid und Cibazol. **[Model Experiments on the Adsorption of Sulphanilamide and Cibazol].**—*Schweiz. med. Wschr.* No. 19/20. pp. 558–560. [French and Italian summaries]. **1816**

The exact function of aminobenzoic acid is not known ; to the chemist it is a very inert and stable substance. It is assumed that it is absorbed on to, and can be liberated from certain groups of the cell protoplasm. In order to study the absorption of *p*-aminobenzoic acid and its replacement by sulphanilamide or cibazol [sulphathiazole] a large number of simpler substances were tried ; animal charcoal was the only one that proved satisfactory. Chromatographic analysis showed that sulphanilamide and *p*-aminobenzoic acid were slightly better adsorbed in acid than alkaline medium. Replacement of *p*-aminobenzoic acid by sulphanilamide and cibazol was demonstrated.—J. F.

MARKOFF, N. G. (1943). Ueber Veränderungen des Blutes im Verlauf der Therapie mit Sulfanilamid und seinen Derivaten. **[Blood Changes during Sulphonamide Therapy].**—*Schweiz. med. Wschr.* No. 19/20. pp. 656–662. [French and Italian summaries]. **1817**

An extensive paper with coloured plates of blood and bone-marrow changes. The most important premonitory symptom is an unexplained rise of temperature ; when this occurs blood examination should be carried out at once. Any of the sulphonamides may produce blood changes, but in this respect they may be placed in the following descending order of toxicity : sulphanilamide, sulphapyridine, sulphathiazole, and sulphamethylthiazole.—JOHN FRANCIS.

SELBIE, F. R., & MCINTOSH, J. (1943). **The Action of Chemotherapeutic Drugs (Including Proflavine) and Excipients on Healthy Tissue.**—*J. Path. Bact.* **55.** 477–481. **1818**

A known quantity of the substance to be tested was dissolved or suspended in water and 0·1 or 0·2 ml. injected into the thigh muscles of mice. The mice were killed after three days and examined. A comparison of the toxicity of various drugs showed that the effects of sulphanilamide and sulphathiazole, even in doses of 30–40 mg. were slight, consisting only of small foci of muscular necrosis and moderate cellular reaction of the connective tissue. Penicillin (the Ca salt) had about the same toxic effects in 5 mg. doses. Proflavine sulphate, 2 : 7-diaminoacridine hydrochloride, and 5-aminoacridine hydrochloride were all slightly more toxic in doses of 0·5 mg. The acridine doses were considerably more toxic, and proamidine and phenol were the most toxic substances, producing extensive muscular necrosis and cellular reaction.

The toxic effects of sulphathiazole powder and sulphathiazole powder containing 1% proflavine were compared by inserting equal amounts of the powders under skin flaps in either side of the abdomen of four rats. The authors concluded that in spite of the apparently greater damage with proflavine there is no ultimate delay in healing ; union of the epidermis was complete in five days in both sides.

It was also shown that various excipients, particularly methyl cellulose, produce considerable muscle necrosis and connective tissue reaction. Liquid paraffin was if anything slightly less toxic than castor oil.—J. F.

RUSSELL, D. S., & BECK, D. J. K. (1944). **Histological Effects of Sulphonamide-Proflavine Mixtures in the Rabbit. Some Experimental Observations.**—*Brit. med. J.* Jan. 22nd. 112–113. **1819**

The histological changes produced by introducing

mixtures of proflavine and sulphonamides into muscle, connective tissue, and brain tissue were studied in rabbits. Whereas sulphathiazole introduced into a skin incision in the thigh produced no harmful effect, the use of a mixture of 1 part of proflavine and 99 parts of the sulphonamide produced necrosis in fascial planes and some superficial necrosis of muscle. Healing in these areas was retarded, but the skin incision healed at the normal rate. The amount of powder introduced was 0·25 g. and the experiments suggest the possible danger of using excessive quantities of proflavine-sulphonamide mixtures in wound treatment.

Mixtures of sulphapyridine (sulphathiazole has been found to possess an epileptogenic action) and proflavine brought into contact with brain tissue caused more damage than when the sulphonamide was used alone. Less damage was produced by a mixture containing 0·5% proflavine than by mixtures containing from 1–4% of this substance.—E. G. White.

Berkman, S., & Koser, S. A. (1943). **Comparative Effect of Certain Sulfonamide Compounds on Nicotinamide-Stimulated Metabolism.**—*J. infect. Dis.* **73.** 57–64. **1820**

Sulphapyridine and sulphathiazole inhibited respiration of dysentery bacilli stimulated by nicotinamide or by diphosphopyridine nucleotide. On the other hand sulphanilamide, sulphadiazine, sulphapyrazine, sulphaguanidine, and sulphacetamide had little or no effect. It is suggested that because of the attached radicals which resemble that of nicotinamide, sulphapyridine and sulphathiazole possess at least one additional potency over sulphanilamide.—John Francis.

Foster, J. W., & Woodruff, H. B. (1943). **Microbiological Aspects of Penicillin. I. Methods of Assay.**—*J. Bact.* **46.** 187–202. **1821**

Foster, J. W., & Wilker, B. L. (1943). **Microbiological Aspects of Penicillin. II. Turbidimetric Studies on Penicillin Inhibition.**—*Ibid.* 377–389. **1822**

I. Large-scale trials of various methods for assaying penicillin are reported. It is concluded that a modification of the Oxford cup method is an excellent all-round technique for routine assays, especially for large numbers. Its accuracy is good, a specific value is obtained, and, from the standpoint of labour involved, it is the most rapid procedure where accuracy is required. A number of experiments characterizing the different methods is reported.

II. In the trials of various assay methods reported in I, it was found that differences in the pH of the medium produced clear-cut differences in the activity of penicillin as judged by the plate method. When tests were carried out in broth, however, and the results judged by turbidimetric methods, the same amount of penicillin effected a 50% growth inhibition of *Staphylococcus aureus* H culture within the range of pH5–8.

It was shown that penicillin inhibition of *Staph. aureus* H is due to logarithmic prolongation of generation time and not to selection of resistant cells. Small losses occur during pasteurization of penicillin solutions. The stability of penicillin is greatest between pH4·8 and 7·9. It is inactivated very rapidly beyond these extremes. A short-time (3–5 hour) turbidimetric assay is described, with *Bacillus adhaerans* as test organism, and growth being accelerated by forced aeration (shaking).—John Francis.

Seelemann. (1943). Die überragende Wirkung neuer organischer Goldverbindungen bei experimentellen Infektionen mit tierpathogenen hämolytischen Streptokokken. **[Superior Action of New Organic Gold Compounds in Experimental Infections with Animal-Pathogenic Haemolytic Streptococci].**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 50. **1823**

White mice were infected with *Str. equi* or "*Str. pyogenes animalis*," and then treated with "Neo II", a preparation containing sodium gold keratinate, or with various sulphonamides. [The dose of bacteria, the amount of the drugs, and the number of animals used not stated.] All untreated mice died, while the proportion of survivors for *Str. equi* and "*Str. pyogenes animalis*" infections was respectively: 91·7% and 80% treated with Neo II, 47·5% and 5% treated with pyrimal [sulphadiazine], 40% and 30% treated with tibatin [galactoside 4,4′-diaminodiphenylsulphone], and 10% of animals infected with "*Str. pyogenes animalis*" and treated with globucid [sulphanilamido-ethylthiodiazole] or eubasin [sulphapyridine].—J. G. Carr.

Schoop, G., & Stolz, A. (1943). Reagenzglasversuche zum Wirkungsmechanismus der Sulfonamide. **[*In vitro* Examination on the Mode of Action of Sulphonamides].**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 49–50. **1824**

Salmonella aetrycke was grown in broth culture for 36 hours and marfanil (*p*-aminomethylbenzenesulphonamide) added in various concentrations. 0·1% did not affect survival, 0·3% killed in 11 days, 0·6% in six days, and 1% in two days. Similar results were obtained with *S. enteritidis*. Spores of anaerobes were tested by immersing in marfanil solutions threads soaked in cultures and then dried. "*B. parasarcophysematos*" was rapidly killed by all solutions over 1%, while *Clostridium oedematiens* was much more resistant, surviving in 3% solution for about 100 hours, and for 30–35 hours in 10% solution. Marfanil had no action on *Cl. oedematiens* toxin.—J. G. Carr.

Hornby, H. E., Evans, S. A., & Wilde, J. K. H. (1943). **The Use of a Phenanthridinium Compound (No. 897) in the Treatment of Zebu Cattle Infected with *Trypanosoma congolense*.**—*J. comp. Path.* **53.** 269–279. **1825**

In earlier experiments on the value of 897 in the treatment of *T. congolense* infection in cattle, the dose used was 10 ml. of a 1% aqueous solution per cwt. body weight. With a single dose given subcutaneously, two animals were cured and one relapsed. With a single intramuscular dose, 14 animals were cured and five relapsed. After a single intravenous injection, the treated animal relapsed, and after five injections at weekly intervals, two animals were cured and one relapsed. An intravenous injection of 20 ml. was rapidly fatal. In these tests, an animal was accepted as cured if weekly blood examination failed to reveal trypanosomes over six months, if the condition was good, and the blood haemoglobin content relatively high.

Later, a dose of 15 ml. of a 0·5% solution per cwt. was used, one dose being injected intramuscularly into one quarter, followed by an injection into the other quarter if a relapse occurred. If the animal relapsed again, three doses were given intravenously at weekly intervals. By this method, 15 animals were cured, three were probably cured, and three were not cured.

—U. F. Richardson.

*Obel, N. (1943). Om tekniken för blodtransfusion vid behandling av piroplasmos in framskridet stadium. **[Technique of Blood Transfusion and the Treatment of Advanced Piroplasmosis].**—*Svensk VetTidskr.* **48.** 343. [Abst. from abst. in *Norsk VetTidsskr.* **56.** 26 & 27]. **1826**

Owing to poor results in the treatment of cattle for piroplasmosis, especially of cows in the pre- and post-parturient period, O. supplemented acaprin

therapy with large-dose blood transfusion (10 litres) with good results.

The usual indirect method was used, whole blood being drawn into citrate solution in litre flasks and thence injected by air pressure into the sick animal. It is said that the injection of 10 litres of blood takes 40 min. by this method.—J. E.

VASIL'EV, A. V. (1935). Lechenie skrytykh i yavnykh form meningitopodobnovo zabolevaniya u loshadi preparatami vismuta i mysh'yaka. **[Treatment of Various Forms of Equine Encephalomyelitis with Bismuth and Arsenic].**—*Trud. Ural'sk. vet.-zootekh. Inst.* No. 1. pp. 41–52. **1827**

Based on his experience in the treatment of 66 horses, 51 of which recovered, V. recommends the treatment of early and latent cases, which may be recognized by the presence of bilirubin in the blood serum and urine, with bismuth and arsenic preparations. [This finding was not confirmed by speakers at the U.S.S.R. conference on E.E. held in 1935—see *V. B.* **13.** 124–126.]—A. MOLDAWSKY.

ASPLIN, F. D. (1944). **Treatment of a Virus Disease of Chickens with Sulphonamides.**—*Nature, Lond.* **153.** 253. **1828**

Continuing the work of BLAKEMORE [*V. B.* **11.** 707.] and of GLOVER [*V. B.* **11.** 309.], A. has studied a number of strains of virus obtained from cases of fowl paralysis. Intraperitoneal inoculation of young chicks resulted in the production of a necrotic lesion in the liver and heart, which became visible to the naked eye 48–72 hours after infection. Diagnosis was based upon the presence or absence of macroscopic lesions, all chicks in these experiments being killed 5–10 days after inoculation.

Treatment of this disease with sulphonamides gave striking results. A total of 138 chicks were inoculated with 18 strains of virus and were treated with sulphadiazine mixed into the food in quantities of $\frac{1}{4}$–$\frac{1}{1}$ g. per oz. None of these chicks developed macroscopic lesions, whilst of 117 similarly infected but untreated control chicks, 101 showed gross lesions on P.M. examination.

The disease was found to be sensitive to treatment with most common sulphonamides, their value in descending order being sulphadiazine, sulphamezathine, sulphathiazole, sulphapyridine, and sulphaguanidine. Owing to its toxicity to chicks, sulphanilamide was valueless.

The action of sulphonamides in this condition appeared to be similar to that in bacterial infections. It was found to be neutralized by *p*-aminobenzoic acid, a virus-containing suspension remaining infective for more than 24 hours when prepared in a saturated solution of sulphathiazole and kept at room temperature. —J. D. BLAXLAND.

GYE, W. E., LUDFORD, R. J., & BARLOW, H. (1943). **The Failure of H 11 to Inhibit Growth of Tumours in Mice.**—*Brit. med. J.* July 17th. 65–67. **1829**

The preparation, known as H 11, which is being used in the treatment of cancer is an extract of urine. It is claimed that the extract contains "anti-growth substances" which have an inhibiting effect upon cancerous growth. The preparation was tested on animals bearing tumours (two carcinoma and two sarcoma strains) and on tissue cultures (two carcinoma and one sarcoma strain) under controlled conditions. The results of these investigations showed that H 11 had no "growth-inhibitory" effects on the tumours used in these experiments.—H. LASER.

I. KIDD, H. A. (1943). **Observations on the Use of H 11 in Carcinoma.**—*Brit. med. J.* July 17th. 67–69. **1830**

II. —. (1943). **H 11 for Cancer.**—*Ibid.* 78–79. **1831**

III. THOMPSON, J. H. (1943). **H 11 for Cancer. [Correspondence].**—*Ibid.* July 31st. 149. **1832**

IV. SCOTT, J. A. (1943). **H 11 for Cancer. [Correspondence].**—*Ibid.* 149–150. **1833**

V. CURTIS, F. (1943). **H 11 for Cancer. [Correspondence].**—*Ibid.* Aug. 14. 211. **1834**

VI. WOODHOUSE, D. L. (1943). **The Effect of Injections of H 11 on the Growth of Mouse Tumours.**—*Ibid.* Aug. 21st. 231–232. **1835**

VII. HANNAN, J. H. (1943). **H 11 for Cancer. [Correspondence].**—*Ibid.* Sept. 4th. 314. **1836**

VIII. BLOOMFIELD, G. W. (1943). **H 11 for Cancer. [Correspondence].**—*Ibid.* Sept. 25th. 403. **1837**

IX. RADNOR, I. (1943). **H 11 for Cancer. [Correspondence].**—*Ibid.* 403. **1838**

X. BARNETT, J. W. (1943). **H 11 for Cancer. [Correspondence].**—*Ibid.* Nov. 6th, 589–590. **1839**

I. K. gives preliminary details of the effect of H 11 extract on various types of inoperable carcinoma in the human subject. In all, 51 cases received treatment, though in 14 of these it was insufficient. Of the remaining 37 patients, 11 are dead and no details were available concerning five. Of the 21 remaining, four have been under observation less than one year, 12 over one year, and five over 18 months. All the surviving cases except two received additional therapy.

K. states that there is some evidence that the rate of growth of some tumours has been slowed or inhibited by the treatment, but in no case confirmed by section has any growth disappeared as the result of H 11 treatment alone. He concludes that no case of carcinoma should be treated by H 11 alone unless it is inoperable, or unsuitable for radiotherapy, etc. Treatment with H 11 must be continued for at least six months.

II. This article levels criticism against the claims made for H 11, the main objections being the evidence of GYE *et al.* [see abst. 1829] that H 11 has no effect on tumours of mice, the great difficulties associated with controlled experiments in the human subject, and the thesis of its discoverer J. H. THOMPSON that cancerous growth is merely excessive physiological growth. His method of estimating the efficiency of H 11 by measuring its inhibition of growth on oat seedlings is also criticized. Objection is also raised to the principle of selling a scientific remedy for financial gain to those who manufacture and market it.

III. This consists of a reply to the article by GYE *et al.* and to II (above). Correspondence is quoted to show that inadequate time was allowed by GYE *et al.* for the effects of H 11 to become apparent, that the injections of the extract were given by variable routes and at irregular intervals, and that a different type of mouse carcinoma was used for the experiments (T.'s claims having referred to the Twort carcinoma only). Finally, Thompson states that the originating laboratories work under a charitable Trust and are debarred from making profits.

IV. S. comments that the papers published on the effect of H 11 on carcinoma of mice do not justify the wholesale condemnation laid down in II (above) and states briefly the points which might be given further consideration in assessing its value.

V. A case report is given of an apparently successful treatment by H 11 for carcinoma in the human subject.

VI. W. reports no inhibitory effect on grafted dibenzanthracene tumours, or induced benzpyrene tumours in mice after prolonged injections of H 11.

VII. This correspondent states that he finds H 11

to be harmless or to exercise some inhibitory action in certain cases of carcinoma in the human subject, and gives an example of a treated case still alive after ten years, despite the failure of surgery, X-rays and radium to cure the condition.

VIII. B. criticizes HANNAN, pointing out that there is no mention of a biopsy having been made in the case reported, and that many so-called "recurrences" after radio-therapy are of a simple inflammatory nature.

IX. R. reports negative results in the treatment with H 11 of various types of cancer in the human subject.

X. B. claims many failures and a few striking favourable results and considers H 11 as an adjunct to other forms of treatment. He ends with a plea for a complete investigation into the possibility of developing a reliable remedy.—JOHN G. CAMPBELL.

SWALES, W. E. (1943). **Observation on the Use of Phenothiazine for Sheep in Eastern Canada.**—*Canad. J. comp. Med.* **7.** 280–284. **1840**

S. mentions various anthelmintics used for controlling parasitism of sheep in Eastern Canada. Observations over a four-year period indicate that the use of phenothiazine administered in a single dose to adult sheep before being turned to pasture for lambing was more efficacious for controlling parasitism in lambs than continual dosing with other anthelmintics. His observations are supported by figures concerning lambs from flocks so treated, which show that a greater percentage of such lambs were marketed earlier with a general increase in the percentage of higher grades. Routine dosing of lambs with phenothiazine is not advocated. Following the administration of approximately three-quarters of a million phenothiazine tablets to adult sheep, losses have been reported on only one farm.—L. M. HEATH.

MCNALLY, W. D. (1943). **The Effect of Varying Doses of a Commercial Phenothiazine Upon Lambs.**—*J. Amer. vet. med. Ass.* **102.** 170–175. **1841**

Using commercial phenothiazine in boluses containing 12·5 g. each in experiments on 15 lambs, of which three were controls, it was found that the drug can be safely given to lambs several times during the year without ill effect; when given regular and more frequently than once in two weeks, pathological changes occurred in the kidneys. A study of the blood picture showed a tendency to polycythemia with the more frequent doses and in those animals receiving one or more boluses per week there was predisposition to an agranulocytosis. The macro- and microscopic findings in eight of the lambs, including one control, which were examined P.M., are detailed.—J. N. OLDHAM.

*KRAUS, F. J. (1943). Erfahrungen mit der Schwefeldioxyd-Begasung. **[Experiences with the Sulphur Dioxide Treatment of Equine Mange].**—*Z. Veterinärk.* **55.** 20–24. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **143.** 456]. **1842**

The SO_2 treatment for mange is safe for healthy horses although traces of the gas are always inhaled. In man, inhalation of small quantities of the gas causes lachrymation, sneezing, catarrh, epistaxis, cough, and even vomiting. In horses, these symptoms of irritation are not observed, but a rise of temperature may be noted and also increased vesicular breathing. These symptoms disappear in a few days, as does the corneal opacity which is occasionally observed. In horses having chronic lung affections or early symptoms of infectious bronchitis, gas treatment is contra-indicated, and liquid sulphur preparations or other remedies should be used for the treatment of mange in such animals. In horses having healed lesions of infectious bronchitis, the inhalation of SO_2 causes the condition to flare up again and even death may result. The P.M. picture in cases of infectious bronchitis complicated by the inhalation of SO_2 is characterized by striking patches of dark red staining in the bronchial mucous membrane. Cavities formed in the lung are due to the infectious bronchitis.—T. E. GIBSON.

MIRONOV, V. S. (1940). Air kak insektitsidnoe i otpugivayushchee sredstvo. **[Sweet Flag, *Acorus calamus*, as an Insecticide and Repellent].**—*Med. Parazitol., Moscow.* **9.** 409–410. **1843**

The powdered roots of the plant, *A. calamus*, were found toxic for *Anopheles* mosquitoes and house flies when sprinkled thickly. Although the toxicity for ticks was minimal, various experiments showed that it acts to a considerable degree as a repellent.

Further experiments with this preparation are recommended.—A. MOLDAWSKY.

HEIMAN, V. (1943). **Sulfathiazole for Colds in Chickens.**—*Vet. Med.* **38.** 26–28. **1844**

In order to test whether sulphathiazole was effective in preventing naturally occurring outbreaks of colds in chickens H. selected 240 apparently healthy four-week-old cross-bred chicks from a group, many birds of which already had colds of varying severity; the selected chicks were divided into six groups of 40 each, three groups receiving an all-mash commercial ration, whilst the other three groups received the same ration with the addition of 0·125 g. of sulphathiazole per oz. of food. The experimental groups were placed into batteries under identical conditions and housed in a large room containing other batteries holding chicks of various ages, many of which were affected with colds.

After two weeks, all chicks were individually weighed and examined, this being repeated every two days. There were some colds in all groups but as long as the ration contained sulphathiazole, not more than 20% of the chicks receiving it showed symptoms of colds, whereas in groups not receiving the drug 90% developed symptoms. On the 27th day, the sulphathiazole supplement was discontinued, all groups receiving the same ration and in a week 80% of the chicks previously receiving the drug were showing symptoms of colds.

Administration of the drug apparently had no harmful effect on growth as the average weight at the end of the experiment was highest in the groups receiving the drug.—J. D. BLAXLAND.

NETTLESHIP, A. (1943). **The Effects of Homologous Tissue Extracts on Rate of Epithelialization.**—*Amer. J. clin. Path.* **13.** 349–351. **1845**

Experimental wounds (excised circles of skin 12–14 mm. in diameter) were made upon rabbits' ears, this site being chosen since the skin here is tightly held to the subcutaneous tissue and cartilage, thus preventing rapid closure of the wound and making measurements of rate of epithelialization possible. Injections of various tissue extracts were made around the wounds and by this means it was shown that the control rate of epithelialization (12–14 days) might be reduced by saline or a variety of tissue extracts (to 10–12 days) and by thyroid and skin extracts still more (to 7–8 days).—RACHEL MARSHALL.

MEDVEDEV, I. D, (1940). O rabote XVII plenuma otdeleniya veterinarnykh nauk Vsesoyuznoĭ akademii s.-kh. nauk im. V.I. Lenina. **[A Report on the 7th Plenary Session of the Veterinary Section of the All-Union Academy of Agricultural Science].**—*Sovyet. Vet.* No. 8/9. pp. 21–25. **1846**

This is a brief discussion of papers dealing with modern animal surgery. Of especial interest are the papers by KHRUSHCHEV on regeneration of wounded tissues, the stimulating action of the leucocytes on the regenerative processes, and the treatment of wounds by application of isolated leucocytes; by KADYKOV on the treatment of suppurating wounds, and by HERMAN on blood transfusion in horses. A group of papers deals with the experiences obtained during the Finnish campaign in 1939, regarding wounds that occurred such as penetrating wounds of the chest and abdomen, treatment of fractures and joint wounds, protective bandages, first-aid organizations, transport, etc. Several papers are devoted to roentgenology and physiotherapy.
—A. MOLDAWSKY.

LOVELOCK, J. E., LIDWELL, O. M., & RAYMOND, W. F. (1944). **Aerial Disinfection. [Correspondence].**—*Nature, Lond.* **153.** 20–21. **1847**

It is considered that effective aerial antiseptics should possess a low vapour pressure, a water solubility of such an order that the bactericide will condense on moist particles, and reasonable stability at room temperature. Tests on the vapours of lactic acid, mandelic acid, and triethanolamine show that these agents fulfil the above requirements. When mixed with the organisms of sprayed saliva, all three have good "kills" (90% or more in 5 min.) at concentrations of 10·8–150 mg. per cu. metre with relative humidities of about 70% at 60°–70°F.—R. E. GLOVER.

PUCK, T. T., ROBERTSON, O. H., & LEMON, H. M. (1943). **The Bactericidal Action of Propylene Glycol Vapor on Microorganisms Suspended in Air. II. The Influence of Various Factors on the Activity of the Vapor.**—*J. exp. Med.* **78.** 387–406. [For part I, see *V. B.* **13.** 34, abst. 226]. **1848**

The bactericidal efficiency of propylene glycol vapour depends on numerous factors, but fundamentally on the concentration of glycol vapour in the air suspended particles. A temperature below 80°F. and an atmospheric relative humidity between 45 and 70% were found to constitute the most favourable conditions for the lethal action of the vapour.

Experiments were performed to test the bactericidal efficiency of propylene glycol vapour in both small and large enclosed spaces. These studies revealed that equally marked bactericidal action is obtained when propylene glycol is dispersed in an 800 cu. ft. room as occurs in chambers of 2 cu. ft. capacity. The susceptibility to vapour action of bacteria re-suspended in saliva was just as great as when broth was used as the suspending medium. Both partially and completely dehydrated bacteria also succumbed to the effects of the vapour. When, however, unsterile dust collected from inhabited rooms was dispersed into the air, little reduction of the natural microbic population contained in this material was observed.

It was shown that pneumococci were killed by amounts of propylene glycol as low as 1 g. in 20 million c.c. of air. Concentrations of 1–5 million to 1–10 million were required to produce the same degree of killing of streptococci and staphylococci.

In general, analogous differences in bacterial susceptibility to propylene glycol were found to hold *in vitro* as were observed in the air. Thus, the pneumococcus which had exhibited the greatest sensitivity to glycol vapour was also found to be the most susceptible to the lethal action of propylene glycol *in vitro*, while the *Staphylococcus albus*, relatively resistant to vapour action, was correspondingly affected to a much less degree in the test tube.—JOHN FRANCIS.

HYGIENE AND PUBLIC HEALTH

DAVIS, J. G. (1943). **The Scientific Control of Milk.**—*Discovery.* **4.** 79–85 & 122–125. [Reprinted as *Pap. Nat. Inst. Res. Dairying.* No. 738. pp. 11]. **1849**

This is a concise account of the principles involved in the production of clean milk and the tests which are in daily use for the detection of adulteration and to stimulate an improvement in its keeping qualities.

The usual methods of pasteurizing milk are briefly dealt with and the phosphatase test is mentioned.

It is suggested that the essential points in any policy for control of the milk supply are :– (1) compulsory pasteurization of all milk other than high-grade T.T. (tubercle-bacillus-free) milk; (2) proper control of all dairies and creameries handling or pasteurizing milk, by the employment of adequately trained personnel; (3) regular testing of all supplies, both raw and pasteurized; (4) quality payment to producers.

The article is a valuable introduction to modern milk production.—H. E. BYWATER.

THOMAS, M. E. (1944). **Milk Administration: Past, Future?**—*J. R. sanit. Ass.* **64.** 5–12. Discussion pp. 12–14. **1850**

T. considers the unsatisfactory state of milk production to be the result of the present method of official supervision. No definite national standards are laid down for the guidance of officials and the responsibility for ensuring a safe and clean milk supply is vested in no less than 11,240 local authorities, each with its own standards. The various aspects of production are supervized by different authorities or by different departments of the same authority. The lack of adequate local government staff, with inadequate travelling allowances, in the rural areas where the bulk of milk is produced, but which are sparsely populated (the local government bodies thus having low incomes) acts against adequate control measures. The weakness of the existing legislation is also a factor of no mean importance.

A brief history of the past and present legislative measures to improve the quality of the milk supply is given, and T. points out that any substantial improvement with the present legislation or by the proposals in the Government White Paper on the nation's milk supply [see *V. B.* **14.** 141.] will entail greatly increased expenditure.

He suggests that the public health department of the local authority is the appropriate body to control milk production. [It is difficult, having read the author's views, to accept this suggestion as a logical conclusion, even if one envisages an enlargement in size and a reduction in the number of local authorities as a result of post-war reorganization.]—H. E. BYWATER.

MELLO, A., & ROGICK, A. F. (1941). Estudofisico-quimico e bacteroologico do leite de cabra em São Paulo. **[Physico-Chemical and Bacteriological Study of Goat's Milk in Sao Paulo].**—*Bol. Industr. Anim.* **4.** 66–72. [English summary]. **1851**

195 samples of ordinary goat milk from 29 sources were examined. Compared with the cow's milk of the same district, the goat milk was very much less contaminated by bacteria. The average number of colonies produced was 483 per ml., and 25·7% of specimens were sterile. The *coli* content was low, and 96·6% of the samples were negative. Tests for reductase and coagu-

lating action indicated that these too were only slightly in evidence. The prevailing bacteria were of the acid-forming type. The acidity ranged over a rather greater range than cow's milk, the density at 15° was 1031·32, fat averaged 4·12% (range 5·6–2·9%) and total solids 15% (range 11·7–13·1%).—J. G. Carr.

Dolman, C. E. (1943). **Bacterial Food Poisoning.**—*Canad. J. publ. Hlth.* **34.** 205–235. **1852**

D. considers that enterotoxigenic staphylococci are the most prevalent cause of food poisoning. Though of widespread distribution, their incidence may be fairly low. Many of the cases of staphylococcal food poisoning were reported on the basis of a positive kitten-vomiting reaction, which reaction can also be elicited by β-toxin. Evidence that the β-toxin and enterotoxin are separate entities is supported by the fact that a β-toxigenic variant isolated from a food-poisoning staphylococcus failed to affect human volunteers when ingested, whereas the parent non-β-toxin culture caused severe reactions. Prior neutralization of the α- and β-toxins with appropriate antisera, together with the more sensitive intravenous route of inoculation, are advocated as the procedures of choice when making tests. The β-toxin is fairly resistant to boiling, consequently any enterotoxin present in heated materials may be brought below detectable levels before the β-toxin is destroyed. Other differentiating points between the two toxins in kittens are (a) β-toxin has a shorter incubation period, and (b) β-toxin often causes death overnight whereas recovery usually follows ingestion of enterotoxin. Although vomiting follows intraperitoneal and intravenous inoculations of kittens with suspected food poisoning strains of *Proteus* and *Bacterium coli*, this did not occur when human volunteers ingested foods heavily contaminated with such organisms. D. believes that many of the "toxin" type food poisonings of unknown origin may in reality be due to enterotoxigenic staphylococci which have been masked or overgrown at the time when the suspected food is examined.—J. L. Byrne.

See also abstr. **1659** (staphylococcal infection from goat milk), **1873** (pasteurization of milk), **1874** (problems connected with milk), **1766** (trichinosis control), **1677** (tubercle bacilli in effluent from sanatorium), **1686** (chlorination of water supplies for *Past. tularensis*).

TECHNIQUE AND APPARATUS

Crimm, P. D., & Martos, V. F. (1944). **Effects of Amigen and Amino Acids on the Growth of Tubercle Bacilli.**—*Amer. Rev. Tuberc.* **49.** 94–104. **1853**

The relative merits of the following media as culture menstrua for strain H37 human type tubercle bacilli were investigated :– a glycerol-peptone-broth medium containing 6% glycerol and a trace of ferric citrate, media containing 1% and 2% amigen (a commercial non-antigenic enzymatic hydrolysate of casein) in place of the peptone of the broth medium, Long's synthetic medium, and a medium containing 1% amigen in place of the 0·5% asparagine of Long's medium. Similar studies were made with a bovine organism (strain Hog no. 2), each of the media in this case being supplemented with 10% glucose.

With H37, the 1% and 2% peptone broths and the 1% amigen broth (all with initial pH 7·2) gave similar results, the pH at the end of a four-week culture period being 5·2 and the bacterial dry weight 1·7–1·9 g. per 100 ml. medium. On the other hand, the 2% amigen broth cultures had a final pH of 8·3 and gave a bacterial dry weight of 2·4 g. per 100 ml. medium. With the bovine organisms the 1% peptone and amigen cultures gave final pH's of about 7·8 and dry weights of 0·85 g. The addition of a range of 19 amino acids to the 1% broth media in concentration of 2 mg. per ml. did not increase bacterial dry weight, though final pH's were kept on the alkaline side of neutrality (7·5–8·0). Little or no difference was observed when growths on Long's medium were compared with those on the amigen-mineral-salt medium : with H37 after four-weeks culture the final pH was about 6·3 and dry weight 1·2 g., while with bovine organisms the final pH was 7·8 and yield 0·75 g. The tuberculins from the various media were merely tested for potency and were not analysed quantitatively.

A comparison of the 1% amigen-salt medium with a synthetic amino acid medium containing 20 amino acids and with other synthetic media containing various groups of amino acids indicated that the amigen medium was very much better than any of the others studied. Of the amino acids tested, phenylalanine, tryptophane, serine, and asparagine were best.—J. Lochiel McGirr.

*Pochon, J., & Amoureux, G. (1941). Application de la mesure du degré de dégradation protéique à l'étude des milieux de culture pour le bacille tétanique. **[Application of the Measurement of Protein Decomposition to the Study of Culture Media for Tetanus Bacilli].**—*C. R. Soc. Biol. Paris.* **135.** 1063–1065. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 151]. **1854**

Following the methods described in an earlier publication, the authors found that toxin production was good when a culture medium containing vegetable pepsin (papain) was used. The protein decomposition index of this solution varied between 600 and 700, and appeared to be particularly favourable for the growth of the bacillus. Horse flesh hydrolysed by 5% sulphuric acid was not suitable for normal growth and toxin production, as protein decomposition was too intense.
—Ann F. Russell.

Burdick, H. O., Watson, H., Ciampa, V., & Ciampa, T. (1943). **A Rapid Test for Pregnancy Gonadotropins on the Basis of Induced Ovulation in Mice.**—*Endocrinology.* **33.** 1–15. **1855**

Ovulation was induced in adult dioestrous, pregnant, and late immature (age, 30 days or more) mice within 24 hours after a single subcutaneous injection of a chorionic gonadotrophin ; an important finding was that the pregnant mouse was more sensitive to this treatment than the dioestrous animal. Dosage and weight of the animal were found to be important factors in the response of immature mice to chorionic gonadotrophin and pregnant mare serum. Within the range of doses used, optimal responses were obtained with 10 I.U. of p.m.s., and with 5 and 2·5 I.U. of chorionic gonadotrophin. No ovulations were seen after injections of less than 2·5 I.U. of p.m.s. or of 1·5 I.U. of chorionic gonadotrophin. Weight of the immature mouse was found to be more important than age ; very few of the animals 30–34 days of age weighing less than 12 g. responded to treatment. Superovulation was seen only after treatment with p.m.s. After ovulation in the mouse, the ampulla of the oviduct is distended with the egg mass and fluid, and is such a definite end-point that it appears of great value as an 18–24 hour pregnancy test, and for the same reason also warrants further investigation as a rapid test of the potency of gonadotrophins.—N. J. Scorgie.

See also abstr. **1696** (culture medium for *Br. abortus*), **1826** (blood transfusion in cattle).

REPORTS

I. Canada, Province of Quebec. (1941). **Report of the Minister of Agriculture of the Province of Quebec for the Year Ending March 31st, 1941.** pp. 119. Quebec: Printer to His Most Excellent Majesty the King. [4to]. Items of veterinary interest pp. 28, 38–41, 90–93 & 96. **1856**

II. Canada, Province of Quebec. (1942). **Report of the Minister of Agriculture of the Province of Quebec for the year ending March 31st, 1942.** pp. 114. Quebec: Printer to His Most Excellent Majesty the King. [4to]. Items of veterinary interest pp. 37–42, 94–97 & 101. **1857**

I & II. A new organization, the breeders' club, for co-operation between owners of milch herds, which started in 1938 with 15 members, has proved its worth, there being 32 clubs with a membership of 900 in 1941. All the herds of members are tuberculin tested, blood tested for contagious abortion, and some are also tested for mastitis. These herds are also being milk tested, and other co-operative effort is in progress. Important developments are expected in the scheme.

Tests are made for Bovine Contagious Mastitis and animals are classified into four grades according to the gravity of each case. Examinations were made in 1941 of 4,231 animals; 3,672 cows were tested. In 1942, 3,814 cows were examined, and 3,400 were tested. 9,364 animals were immunized against Anthrax in 1941 and 12,583 in 1942. Staff from the Dominion Department of Agriculture make tests for Tuberculosis under the Ideal and Supervision schemes, the Provincial Government paying their travelling expenses. Compensation is paid for reactors condemned. Cattle tested were 285,344 in 1941 and 324,333 in 1942, the reactors being 0·68% and 0·95% respectively. Animals immunized against Haemorrhagic Septicaemia were 123 in 1941 and 573 in 1942. 118,830 blood tests for Pullorum Disease were made in 1941 and 128,492 in 1942. 42,440 cattle were tested for *Brucella abortus* Infection in 1941 and 77,660 in 1942. There were 121 cases of Equine Infectious Anaemia in 1941 and 218 in 1942. Mortality among these was 31·4% and 20·53% respectively. There were no records of cases of Equine Encephalomyelitis in 1941 and 1942. 6,542 sheep were treated for Helminthiasis in 1941 and 11,954 in 1942.

The Quebec Veterinary School.—Forty-eight students were enrolled in 1941 and 46 in 1942. A pre-veterinary year devoted to basic scientific subjects has been added to the course. Details are given of the cases treated by the ambulatory clinical service.

Contagious Abortion agglutination tests were carried out by the Pathology Department of Macdonald College; this department deals with certain other veterinary work.

Work begun in the Institute of Parasitology in 1940 was continued on the relationship between parasitic worms and the production of bacon pigs, and on phenothiazine in nematode control in sheep. In a large-scale field test of explosive phenothiazine tablets in sheep, Nodular Disease was practically eliminated (99·1% reduction in lesions). About 75% of pigs are stated to be infected with ascarids but the loss in young stock is probably correlated with anaemia and diet. A survey in eastern Canada showed that 1·2% of adult men examined suffered from Trichinosis.—J. A. G.

I. India, Hyderabad-Deccan. (1940). **Annual Administration Report of the Civil Veterinary Department, H.E.H. the Nizam's Government, for the year 1347 Fasli (6th October 1937 to 5th October, 1938).** [Badami, B. K.] pp. 65. Hyderabad-Deccan: Govt. Central Press. [8vo]. **1858**

II. India, Hyderabad-Deccan. (1940). **Annual Administration Report of the Civil Veterinary Department, H.E.H. the Nizam's Government for the year 1348 Fasli (6th October 1938 to 5th October, 1939).** [Badami, B. K.] pp. 62. Hyderabad-Deccan: Govt. Central Press. [8vo]. **1859**

I. The staff consisted of the Director, 5 deputy superintendents, 16 veterinary inspectors, 44 assistant veterinary surgeons, and 35 subordinates. In addition, there was one veterinary disease investigation officer, appointed by the Imperial Council of Agricultural Research.

1,191 outbreaks of contagious disease were reported during the year, the mortality from Foot-and-Mouth Disease showing an increase to 641 as against 156 in the previous year; mortality from the other major diseases diminished, *viz*, Haemorrhagic Septicaemia, 4,580 (5,907), Blackleg, 1,516 (1,895), and Rinderpest, 1,974 (3,834).

2,203 specimens were examined in the laboratory. Intensive operations against liver fluke were directed to the destruction of the snails and resulted in reduced mortality from the disease.

There was a fall in the number of preventive inoculations during the year from 335,475 to 245,458. The temporary virus production department produced 388,400 doses of vaccine and virus of which 241,825 were issued. 414,356 sick animals were treated during the year and 39,284 castrations performed.

Four new hospitals were opened. Breeding operations at the Hingoli stud continued satisfactorily, and Deoni cattle from this stud won two first and also other prizes at the All-India Cattle Show. Rural uplift work continued.

II. The number of assistant veterinary surgeons was increased by two and that of the subordinate staff by 42 during the year.

8,645 deaths from contagious disease occurred as against 10,176 in the previous year. The mortality figures for most diseases showed a satisfactory reduction, but the 2,922 deaths which occurred from Rinderpest in buffaloes compared unfavourably with 567 in the preceding year. There was also a large increase in the number of cattle dying from parasitic diseases. Canine Surra was diagnosed for the first time in Hyderabad State. In one area, a large number of animals were suspected to have fluorine poisoning, due to fluorides in the drinking water. The Assistant Entomologist of the Imperial Veterinary Research Institute, Mukteswar, visiting the State in the prosecution of his investigation on warble fly failed to discover evidence of these parasites in Hyderabad. Operations to control Liver Fluke Disease by snail destruction progressed satisfactorily.

2,302 specimens were examined microscopically during the year. 439,275 sick animals were treated and 41,307 castrations were performed. There was a further fall in the number of preventive inoculations, from 245,458 to 181,944. 380,500 doses of rinderpest tissue vaccine produced at the virus depot were issued.

—L. H. Shirlaw.

India, Ajmer-Merwara. (1942). **Annual Administration Report of the Civil Veterinary Department in Ajmer-Merwara, British Rajputana for the year 1940-41.** [Jerrom, J. H. G.] pp. 13. [8vo]. **1860**

*India, Bengal. (1942). **Annual Report of the Civil Veterinary Department, Bengal, and of the Bengal Veterinary College for the year 1940-41.** [Ali, S. M.] pp. 57. 4 appendixes. Bengal: Supt. Govt. Printing, Bengal Govt. Press. [8vo]. [5 annas]. **1861**

*India, Bihar. (1942). **Annual Report of the Civil Veterinary Department, Bihar, for the year 1940-41.** [Malik, M. I.] pp. 30+iii+2. Bihar, Patna: Supt. Govt. Printing. [8vo]. [Rs. 1-2-0]. **1862**

India, Gwalior. (1941). **Annual Report, Veterinary Department, Samvat 1997 (1940-41).** [Apte, S. M. S. pp. 40. Gwalior: A.D. Press. [fcp]. **1863**

India, Hyderabad-Deccan. (1942). **Annual Administrative Report of the Civil Veterinary Department H.E.H. the Nizam's Government, for the year 1350 Fasli (6th October 1940 to 5th October 1941).** [Badami, B. K.] pp. 68. 2 appendixes. Hyderabad-Deccan: Govt. Central Press. [8vo]. **1864**

India, Madras. (1942). **Annual Administration Report of the Madras Civil Veterinary Department for the Year 1941-42.** [Hurley, T. J.] pp. 93. Madras: Supt. Govt. Press. [8vo] [12 annas]. **1865**

India, Mysore. (1942). **Annual Report of the Superintendent of Veterinary Services in Mysore for the Year 1940-41, with the Government Review Thereon.** [Achar, S. D.] pp. 139. 20 appendixes. Bangalore: Govt. Press. [8vo]. **1866**

India, United Provinces. (1942). **Annual Administration Report of the Civil Veterinary Department for the year 1941-42.** [Egan, T. J.] pp. 27. Allahabad: Supt. Printing and Stationery. [8vo] [6 annas]. **1867**

Additional Notes

Ajmer-Merwara

1,005 deaths from Rinderpest occurred among sheep and 412 among goats. 180 sheep were immunized against Sheep Pox; 76 goats were vaccinated against Contagious Pleuro-Pneumonia by formolized lung tissue of a diseased goat; 68 unvaccinated and four vaccinated goats died.

Bengal

The Propaganda Section did much valuable work during the year under review, including lectures, exhibitions and demonstrations, and the production of pamphlets on animal management and disease for the use of farmers.

There was a very appreciable decrease in mortality figures among livestock. Several "Stand Still Camps" for the isolation of cases of contagious and infectious disease were established in the province.

An investigation officer for the Diseases of Poultry is shortly to be appointed.

The preparation and distribution of goat-tissue

I	II	III	IV Cattle Diseases (no. of deaths)					
Department	Total Veterinary Staff	Budget (in rupees)	Rinderpest	Haemorrhagic Septicaemia	Foot & Mouth Disease	Blackleg	Anthrax	Other Contagious & Parasitic Diseases
Ajmer-Merwara, 1940–41	5	10,170	—	—	—	—	—	4
Bengal, 1940–41 ...	207	6,59,000	22,455	2,209	518	211	1,005	3,676
Bihar, 1940–41 ...	164	6,75,751	2,522	2,212	29	377	397	433
Gwalior, 1940–41...	93	80,866	226	295	186	205	265	18,622
Hyderabad-Deccan, 1940–41	145	Not given	3,827	1,744	76	973	164	775
Madras, 1941–42 ...	385	12,53,943	9,189	2,807	802	3,311	1,426	2,889
Mysore, 1940–41 ...	Not given	Not given	1,032	752	705	5,337	2,214	2,076
United Provinces, 1941–42	265	4,26,734	4,539	2,452	515	773	308	293

* The three figures for each disease in section V represent (1) serum alone inoculation, (2) vaccine inoculation, and (3) serum-

rinderpest vaccine and other biological products was successfully conducted by the vaccine depots at Calcutta and Chittagong.

The incidence of BOVINE ENZOOTIC HAEMATURIA was found to be on the increase; copper sulphate was tried in a few cases with promising results. BOVINE ABORTION, VERMINOUS PNEUMONIA in goats, and poultry diseases received special study.

Sixty-seven new students were admitted to the Veterinary College, making a total of 225 on the rolls during the year; 54 students graduated. In addition, courses for dressers' and veterinary dispensers were held. 1,421 specimens were examined in the laboratory during the year. The activities of the poultry section were extended.

BIHAR

Mortality among livestock from contagious diseases was reduced by almost 50%.

2,073 pathological specimens were examined during the year. A scheme for the investigation of poultry diseases was inaugurated.

Departmental staff delivered 11,330 propaganda lectures to village populations throughout the province.

Forty-one new students were admitted to the Veterinary College at the beginning of the year, making a total of 139 students on the rolls; 37 out of 45 students passed the diploma examination, ten gaining distinction.

GWALIOR

A new post of Investigation Officer for Animal Diseases was created during the year.

HYDERABAD-DECCAN

The mortality due to RINDERPEST was more than double that of the previous year, and that from HAEMORRHAGIC SEPTICAEMIA showed a heavy increase. The incidence of SHEEP POX and PLEURO-PNEUMONIA of sheep showed an appreciable decrease.

The production of goat-tissue vaccine at the virus depot was extended, 399,200 doses being produced and 296,200 issued.

Special investigations were conducted upon FLUOROSIS in cattle, CONTAGIOUS ABORTION in cattle, EQUINE ENCEPHALOMYELITIS, CIRCLING DISEASE in sheep, and CONTAGIOUS PLEURO-PNEUMONIA in goats. A scheme for the control of LIVER FLUKE INFESTATION and one for the investigation of diseases of poultry in the Nizam's Dominions have been sanctioned.

MADRAS

The Serum Institute continued to function effi-

V Preventive Inoculations of Bovines				VI Veterinary Work				
				Hospitals & Dispensaries				
inderpest	Haemorrhagic Septicaemia	Blackleg	Anthrax	No. of Hospitals	No. of Dispensaries	Treatments including Supply of Medicines	Treatments on Tour	Castrations
—	—	—	—					
1,005	—	—	—		3	7,351	1,007	963
—	—	—	—					
8,954	9,666	875	12,750					
492,712	13,676	1,590	1		68	217,367	108,921	3,186
3,757	—	—	—					
31,591	41,094	7,313	10,819					
550,042	4,089	3,553	47	29	§299	141,673	354,512	130,347
802	—	—	—					
12,442	—	—	—					
233,390	2,178	7	—	13	17	185,888	26,815	27,276
—	—	—	—					
8,728	13,580	†19,750	† 1,805					
144,936	27,686	—	—		111	375,222	48,091	49,071
40,301	54,501	1,403	—					
1,084	3,076	555	4,115					
—	174,236	112,136	—		123	315,774	199,214	120,089
412,318	—	—	—					
—	—	195	28,266					
45,758	47,842	†232,002	—		81	675,727	79,511	88,497
738	—	206	—					
5,482	79,731	19,053	7,785					
283,411	166,897	305	—		197	750,079	150,668	197,644
14,482	—	—	—					

us inoculation. † In some instances bacterin or "agg." [meaning not clear] added. § Includes field dispensaries.

ciently. 45,384 specimens were examined during the year in the Institute and College laboratories.

The administration of sterilized bone meal in the food (2 oz. a day for two months) was shown to have good results in cases of FLUOROSIS. The transmission of blood from fowls with NEWCASTLE DISEASE to healthy fowls and pigeons failed to set up infection. Studies on the life-history of the nodular worm, *Oesophagostomum radiatum* were completed during the year. A monograph on the anatomy of the ox is being prepared.

A scheme to study the indigenous drugs of India used in veterinary practice, with special reference to their toxicology is being worked under the control of the medical department.

Twenty-nine new candidates were admitted to the College at the beginning of the year, making a total of 110 students on the rolls. Eleven students of the four-year course and six of the three-year course passed the diploma examinations ; 14 students took the B.V.Sc. degree. A refresher and a stockman's course were also held during the year.

MYSORE

The investigations, partly financed by the Imperial Council of Agricultural Research, into JOHNE'S DISEASE in cattle and into poultry diseases are steadily progressing.

The Serum Institute was able during the year to meet all requirements for biological products.

UNITED PROVINCES

A scarification method of vaccinating cattle and buffaloes against RINDERPEST was given extensive trials in the control of actual outbreaks and results were encouraging. The duration of immunity was found to be solid up to 22 months following vaccination by this method. With a view to facilitating the transport of vaccine and prolonging its keeping qualities, an experiment with desiccated spleen tissue in powder form was carried out in a controlled experiment, with encouraging results. Sodium thiosulphate by the intravenous route was used in the treatment of reonja poisoning in sheep, with encouraging results.

A survey of the incidence of HELMINTH PARASITES in goats revealed the occurrence of (a) *Trichostrongylus colubriformis*, the duodenal nematode which had hitherto been known to occur only rarely in goats ; (b) two species of tapeworms of the genus *Avitellina*, also hitherto rarely met with.

The herd at the Indian Military Academy Dairy Dehra Dun has, for the first time, been vaccinated with live vaccine against BRUCELLOSIS. A survey of the poultry problems of the province has been inaugurated.

—L. H. SHIRLAW.

I. GOLD COAST COLONY. (1942). **Report on the Department of Animal Health for the Year 1941-42.** [STEWART, J. L.] pp. 5. Accra : Govt. Printer. [fcp] [1s.] **1868**

II. GOLD COAST COLONY. (1943). **Report on the Department of Animal Health for the financial year 1942-43.** [STEWART, J. L.] pp. 5. Accra : Govt. Printer. [fcp] [1s.] **1869**

I. *General.*—The general livestock position was satisfactory. There was an increased demand for animals for slaughter on account of war conditions and this gave the veterinary department some anxiety, since there was a danger that the livestock population would be depleted through the slaughter of immature animals. The trade in cattle and sheep from French West African colonies ceased, except for a few sheep which slipped through. There was an increased demand for slaughter animals by the military and the mines.

Livestock development in the Northern Territories is hampered by shortage of water and TRYPANOSOMIASIS. Departmental funds are not sufficient to affect the situation very much. In the coastal section in which a few cattle exist, the position is even more adverse for livestock on account of the badly distributed rainfall.

The European staff was depleted and a greater amount of the responsible work was carried out by Africans, both in the field and the laboratory, in a competent manner.

Diseases.—TRYPANOSOMIASIS was more widespread owing to the greater dispersal of tsetse-fly through the heavy rains of 1941. For eradication of tsetse-fly, large-scale clearings were being made in the Naboggo river valley in co-operation with the Dagomba Native Administration. Much remained to be done in the co-ordination of effort in tsetse eradication and afforestation.

Many small outbreaks of RINDERPEST occurred in the Northern Territories. Mortality as a rule was not high, but in one outbreak there were 1,000 deaths among susceptible cattle. The annual immunization of young cattle is carried out with the co-operation of the native cattle owners. Some difficulties were encountered in the production of anti-rinderpest serum and vaccine in the early part of the year, which held up immunization in two of the sections under veterinary control.

An outbreak of BOVINE CONTAGIOUS PLEURO-PNEUMONIA occurred in the coastal area which, it is said, was introduced by cattle imported from Nigeria. Only a few local cattle became infected and this, it is thought, was due to the protection obtained from the use of the attenuated culture used as a vaccine. Inoculations of this vaccine take place each year.

Laboratory Work.—The staff produced 5,044 litres of anti-rinderpest serum, 650 litres of anti-rinderpest spleen vaccine, 177,825 doses of bovine contagious pleuro-pneumonia culture vaccine, and small amounts of anti-rabic and of other vaccines and sera. No research work was attempted, but some minor investigations were carried out. In further trials to infect animals by the methods practised by METTAM *et al.* [*V. B.* **10.** 511.] for the transmission of BOVINE CONTAGIOUS PLEURO-PNEUMONIA, results were negative. It is stated that the conditions of the tests were not adequate.

Other small-scale investigations were made in aid of field work on poultry, pig, and sheep diseases. SPOROTHRICOSIS in cattle and pigs was difficult to cure ; the fungus was not identified. Tests carried out of some new preparations showed that M & B 744 clears the peripheral blood of *Babesia bigemina.*

Animal Husbandry.—This section covers the work on the Pong Tamale station, the Native Administration Farms, the Nungwa Farm in the Coastal Veterinary Section, and in the field.

II. *General.*—The French West Africa frontier was reopened for livestock movements into the Northern Territories, but this did not improve the livestock position as the French had their own food shortage problems.

Most of the work of the Department continued to be in the Northern Territories. Co-operation with the Agricultural Department was closer. There was also a restoration of co-operation with the *Service Zootechnique* of the Ivory Coast. Efforts to increase food production were again the main preoccupation of the Department. Details are given of what is being done to meet military demands for meat. Reference is again made to the serious shortage of water for livestock.

Diseases.—There was no change in the RINDERPEST position. Several outbreaks of the disease occurred among susceptible young animals. 40,000 cattle were

immunized. Mortality was low except where the work extended over to the rains. Outbreaks of BOVINE CONTAGIOUS PLEURO-PNEUMONIA occurred in several herds imported from French Territory. The local herds are given an annual inoculation of the culture vaccine and this is relied on as an effective protection since, up to 1943, there had been no serious extension of the disease to local cattle. ANTHRAX occurred around Accra and there were a few cases of RABIES; anti-rabic vaccine was used. FOOT AND MOUTH DISEASE appeared among imported cattle particularly those arriving from long overland journeys in poor condition. The disease is not an important menace to local cattle.

Laboratory Work.—Acriflavine 0·02% was added to the anti-rinderpest serum produced and proved satisfactory. Experiments with goat virus were in progress. Vaccines produced included over 250,000 doses of bovine contagious pleuro-pneumonia culture vaccine, anti-rabies vaccine, fowl-pox vaccine, and fowl-cholera serum.

A CONTAGIOUS PNEUMONIA of sheep which caused a mortality of 40% is thought to be due to a virus. In pigs, SWINE FEVER was diagnosed and SPOROTHRICOSIS cases were cured, it is stated, by the use of a dressing of sulphur in "engine oil". Chigger-flea (*Tunga penetrans*) infection of the coronets and mammae in sows was encountered.

Details of the work in progress on the tsetse-fly eradication are given.

Animal Husbandry.—Details are given of the work carried out and in progress. SPIROCHAETOSIS is a serious obstacle to the poultry industry. In experiments, the vector tampan tick was controlled by housing the poultry in moveable arks which can be dipped.—J. A. G.

GOLD COAST COLONY. (1943). **Report on the Department of Agriculture for the year 1942-43.** [WATERS, H. B.] pp. 8. Accra: Government Printing Dept. Items of veterinary interest p. 1. **1870**

A serious outbreak of TRYPANOSOMIASIS in pigs at the Pokoase Farm was brought under control by the provision of tsetse-fly proof buildings. The large Army pig farm is being successfully run under European management.—J. A. GRIFFITHS.

GOLD COAST COLONY. (1943). **Report on the Medical Department for the year 1942.** pp. 8. Accra: Govt. Printer. [fcp] [1s.] Items of veterinary interest pp. 2 & 5. **1871**

There were 20 cases of RABIES treated and four deaths. Slaughter houses are inspected by health or municipal inspectors who have had additional large numbers of carcasses to examine for consumption by the armed forces.—J. A. GRIFFITHS.

NIGERIA. (1943). **Veterinary Department. Annual Report for the year 1941.** [HENDERSON, W. W.] pp. 10. Lagos: Govt. Printer. [8vo] [6d.] **1872**

Disease Control.—12,871 cattle were treated for *Trypanosomiasis* by tartar emetic solution given intravenously. 92,105 calves, sheep and goats were dosed for helminths. 433,073 cattle were immunized against RINDERPEST by serum-virus inoculation; 182,251 cattle were given temporary immunity by inoculation of formalinized spleen-pulp vaccine. 293,702 cattle were given CONTAGIOUS PLEURO-PNEUMONIA vaccine, 562,348 cattle BLACKLEG vaccine, 48,353 cattle HAEMORRHAGIC SEPTICAEMIA vaccine, and 34,207 cattle and 741 sheep ANTHRAX vaccine. Increasing numbers of poultry were being vaccinated against FOWL POX and FOWL TYPHOID. The results of the immunizations carried out are shown in the freedom from large-scale epizootics, despite the war-time relaxation of the normal restrictions on the movements of cattle. A strain of RINDERPEST goat virus introduced from Kenya although not sufficiently attenuated for use alone in Nigeria was used with small doses of serum, in small-scale experiments, with such good results that it is intended to use the method on a larger scale in field work.

The incidence of BOVINE CONTAGIOUS PLEURO-PNEUMONIA tended to increase. ANTHRAX, BLACKLEG and HAEMORRHAGIC SEPTICAEMIA occurred in sporadic outbreaks which were dealt with by vaccination. Fifty-seven cases of RABIES were proved positive. This does not represent the actual number of cases which occur among the large number of native owned and stray dogs.

Animals brought into the 33 animal clinics in Northern Nigeria which are supervised by the veterinary department numbered 25,216 new cases. The most important diseases met with in horses and donkeys are EPIZOOTIC LYMPHANGITIS and TRYPANOSOMIASIS.

FOWL TYPHOID is generally endemic among domestic fowls and turkeys. FOWL POX has caused heavy losses in some areas. SPIROCHAETOSIS is fairly common among domestic fowls and less so among turkeys. Soamin, when given subcutaneously in doses of 0·05 g., cured 90% of cases.

Animal Husbandry.—20,123 bulls were castrated and 76,392 goats. A policy of fostering the breeding of the red sokoto and the brown Kano breeds of Nigerian goats had been carried out for over seven years, by the castration of all male goats of cross-bred or other breeds in the provinces in which the production of goats skins is an important industry.

The report also includes an account of the increasing activities of the Department in fostering the production of foodstuffs of animal origin. These include the marketing of animals for slaughter and for export, the supervision of local government dairies, where fresh milk is purchased from cattle owners for the production of fresh butter or a high quality clarified butter fat, depending on the transport facilities available for marketing the products, the general supervision of schemes for fostering the commercial utilization of animal products such as ghee, produced from native-made butter, fattening of animals for beef and mutton, and the initiation of and control of experiments for the production and marketing of new products in Nigeria; among these are cheese making and the local manufacture of bacon. There is also the large trade in hides and skins both for local markets and for export. The value of those exported in 1941 was £610,792—a reduction due to the restrictions on shipping space.

Veterinary Education.—A scheme for the higher training of Africans was approved with a 6½-year course for assistant veterinary officers and a three-year course for veterinary assistants. The short course was started at the veterinary headquarters laboratory at Vom.

Laboratory Work [METTAM, R. M.].—The main work continued to be the manufacture of RINDERPEST antiserum and of various vaccines required by the field staff. The output of serum was greatly reduced owing to the difficulty of obtaining susceptible young animals for producing the rinderpest virus used in the hyper-immunization of the serum producers. Specimens sent to the laboratory for diagnosis increased to 5,571, mainly blood smears.

The following investigations were made. A calf examined which was from a herd infected with TUBERCULOSIS in Bauchi province gave a positive reaction to the tuberculin test. At P.M. examination it showed small tuberculous foci in the mediastinal and mesenteric lymph nodes. The dam was reported as having extensive lesions of the udder, mesenteric and mediastinal lymph nodes. The intradermal tuberculin test is said to have

proved practical and reliable in Nigeria. An outbreak of FOWL CHOLERA was diagnosed in the Plateau province; a vaccine was issued to control the outbreak. *Aegyptianella pullorum* transmitted by *Argas persicus* was diagnosed in fowls from Bauchi and Ilorin provinces. In the fowl from Bauchi the blood also showed *Plasmodium gallinaceum* INFECTION (AVIAN MALARIA).

In field tests, it was found that half the dose of immune serum required for use with Nigerian bovine RINDERPEST virus was sufficient for use with an attenuated goat-virus of bovine origin, a great economy.

This attenuated strain of goat virus was obtained from Kenya veterinary laboratory where it had undergone 330 serial goat passages. Large numbers of cattle had been inoculated with this attenuated virus by the end of the year. In one lot of 11,098, the mortality was 1·37%. Advantages of this goat virus are that reacting cattle are not infective for healthy in-contacts and bovine blood parasites are not likely to be transmitted by the blood virus. The mild reactions reduce the mortality rate not only from rinderpest but also from the enzootic diseases due to tick- and tsetse-borne parasites (anaplasmosis, redwater, and trypanosomiasis). The goat virus had been used as fresh blood, but it was to be desiccated and issued direct from the laboratory as a powder for use in the field.

Both phenothiazine and tetrachlorethylene have been found satisfactory in use against *Haemonchus contortus*.

Veterinary Education.—A three-year course of study for veterinary assistants commenced early in November with ten students. The standard is elementary, with six months each year, of study and demonstrations at the school and six months at an immunization camp under a veterinary officer.

During the year the first students for the 6½-year course commenced the pre-veterinary studies at Yaba Higher College. It was intended that the veterinary course should be taken at Vom as soon as accommodation could be provided.—J. A. GRIFFITHS.

BOOK REVIEWS

HILL, H. [F.R.San.I., A.M.I.S.E., F.S.I.A., Sanitary Inspector, Borough of Southgate]. (1943). **Pasteurisation.** pp. viii + 152. London: H. K. Lewis & Co., Ltd. [8vo] [10s.] **1873**

This small book, which is written by a sanitary inspector, gives a practical insight into the efficient operation of commercial pasteurization plants, and will be found a means of ready reference to those whose duties include the supervision of the processing of milk.

The arguments usually raised in favour of, and against, pasteurization are dealt with in a concise manner, but veterinary readers may find room for criticism in some of the statements concerning diseases of animals which are likely to infect the milk supply. This, however, does not greatly detract from the conclusion reached in favour of pasteurization.

The various types of pasteurization plants are dealt with and, although greatest prominence is given to the "holder" method, the high temperature short time process (H.T.S.T.), the "flash", and the "continuous flow" methods are all described.

A useful chapter is included on pasteurization in bottles. This process has not at present been adopted to any large extent, but future developments will doubtless take place along these lines. The machinery and methods used in washing, sterilizing, and filling bottles are dealt with and a special chapter is devoted to the cleansing of plant and washing machines.

Although this book naturally deals primarily with pasteurization, sections are included relating to sterilization, homogenization, and irradiation of milk, whilst one chapter deals with milk testing and laboratory control.

The absence of illustrations is an obvious defect, but the book will serve as a useful primary reference to those who are interested in the operation of commercial pasteurization plants, especially from the public health point of view, but it is to be regretted that references to other works of a more detailed nature are not included.
—H. E. BYWATER.

ENOCK, A. G. (1943). **This Milk Business. A Study from 1895 to 1943.** pp. xi + 243 + xii-lii. 14 plates. London: H. K. Lewis & Co., Ltd. [8vo] [18s.] **1874**

An attempt has been made to deal with practically all the problems involved with milk from the time when it is produced until it is consumed, stress being laid on those aspects which are desirable in order that a safe milk supply may be available to the public at a reasonable price.

Sir GEORGE NEWMAN, late Chief Medical Officers Ministry of Health, in a foreword to the book, state, that the author "is an expert engineer who has been brought into close professional and personal contact with medical men and sanitarians in various parts of the world, and has devoted many years to unravelling the technicalities and intricacies of producing a clean and safe bottled milk . . .".

The author deals mainly with the handling and processing of milk, particularly with the various methods of pasteurization and the defects which are likely to arise during the operation. He gives advice for making the processing more efficient, stating that the only really efficient method of pasteurization is to treat the milk after it has been placed in the bottle and not to bottle the milk after it has been pasteurized in bulk.

The author has made very wide contacts during his lifetime and the opinions of many authorities are given. It is felt, however, that he allowed himself too much latitude and that a more valuable work would have been produced had he restricted himself entirely to pasteurization and the ancillary processes such as bottling, etc. An example of this latitude is the attempt to deal with such subjects as the development of microscopy, with short monographs on the work of VAN LEEUWENHOEK, SPALLANZANI, PASTEUR, and KOCH.

A list is given of the principal outbreaks of infectious disease which have occurred in Great Britain due to contaminated milk. The main causes of infection are discussed, and the importance of efficient cleansing and sterilization of milk utensils is emphasized.

The actual production of milk is dealt with in a very sketchy manner and is mainly concerned with the financial aspect. Apparently, the author's contact with this branch of the industry has been somewhat perfunctory and although he has had wide contact with the medical profession, scientists, sanitary inspectors, and milk operatives, he has apparently failed to realise that veterinary surgeons are concerned with the problem of milk production.

The book concludes with a chapter on the future of the milk industry and the author's suggestions for the supervision of the industry by a National Milk Control Board, the composition of which is unlikely to receive the approbation of public health officials or of the veterinary profession.

The book should prove of use as a reference for those interested in the processing and distribution of milk.—H. E. BYWATER.

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No. 2.—Issued June. Indexing period previous July—December.

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